

# Machine and Tool **BLUE BOOK**

A DIGEST OF THE METAL WORKING INDUSTRY

**DECEMBER 1947**

**THIS MONTH**

Carbide Sheet Metal Dies

Roto Finishing of Metals

Surface Defects of Die Castings

Features of Handwheel Design

What's New in Metalworking

Available Literature

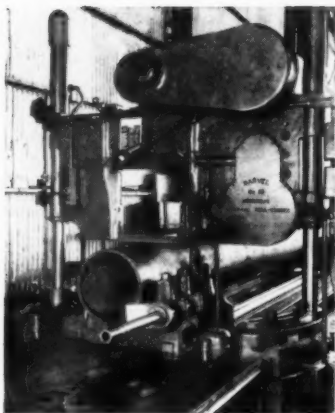
Shop Hints

**Advertisers' Products Index**

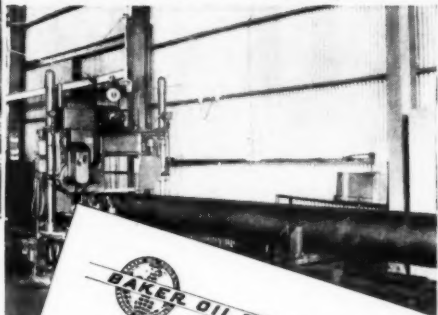
**Index to Advertisers**

**COMPLETE INDEX ON PAGE 5**

**A HITCHCOCK PUBLICATION**



# TUBE CUTTING on a LARGE SCALE at BAKER OIL TOOLS, Inc.



Cutting-off steel tubing, generally considered a slow and costly operation is done quickly and economically, on a large scale, at Baker Oil Tools, Inc. two plants. Really large tubes, up to 18" in diameter are handled on the Giant No. 18 Marvel Hydraulic Hack Saw, illustrated above, quickly and accurately cutting off large steel oil well casing and casing coupling stock. This company also has a No. 6A MARVEL High Speed Production Saw, (capacity 6" x 6") for automatically cutting off single or nested tubes or bars of smaller diameter. Solid stock or tubes, they're all the same to MARVEL Saws.

Whatever your metal sawing problems, there are MARVEL Saws exactly suited to your requirements. Your local MARVEL Sawing Engineer will gladly analyze your problem, make recommendations and quote costs.

Write for Catalog



**MARVEL** Metal Cutting  
**SAWS**  
Better Machines - Better Blades

**ARMSTRONG-BLUM MFG. COMPANY**

5700 BLOOMINGDALE AVENUE

"The Hack Saw People"

CHICAGO 39, U. S. A.

You get **these advantages**

with every

**HOBART**  
M-R\* welder



**remote control** (exclusive with Hobart)  
is yours at no extra cost

This ingenious feature encourages every operator to do his **very best work**—by making it **easy** to adjust his welding heat to suit every job, regardless of size or shape of work, type of electrode, or position of the weld.

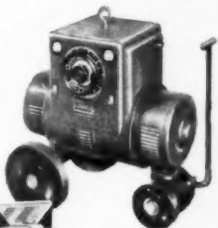
**\*multi-range-dual-control** provides ten (10) ranges of welding current—with one hundred (100) fine adjustment steps in **each** range subject to remote control. One thousand (1,000) combinations of current and voltage—an advantage not offered in ordinary welders. Put Hobart on your job, and you'll know **real** high-quality, low-cost welding. Mail the coupon below to:

**HOBART BROTHERS CO., Box TB-127, TROY, OHIO**

**One of the World's Largest Builders of Arc Welders**



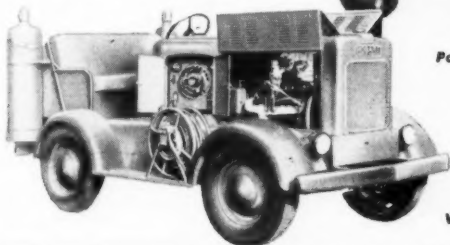
**Gas Drive Welder**



**Portable Electric Welder**



**"Build Your Own"**



**Hobart Weldmobile**



Hobart Electrodes assure you of uniformly high quality performance under all conditions—in the shop or the field. Check coupon right for information.



**Hobart Brothers Co., Box TB-127 Troy, Ohio**

Without obligation, tell me more about Hobart's multi-range-dual-remote-control—and other weld-improving features. I'm interested in:

☐ Electric Drive ☐ Gas Drive ☐ Electrodes ☐ Accessories

NAME \_\_\_\_\_ POSITION \_\_\_\_\_

FIRM NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

# RIVETT

## WHEN COSTS AND QUALITY COUNT The New 918-S TURRET LATHE

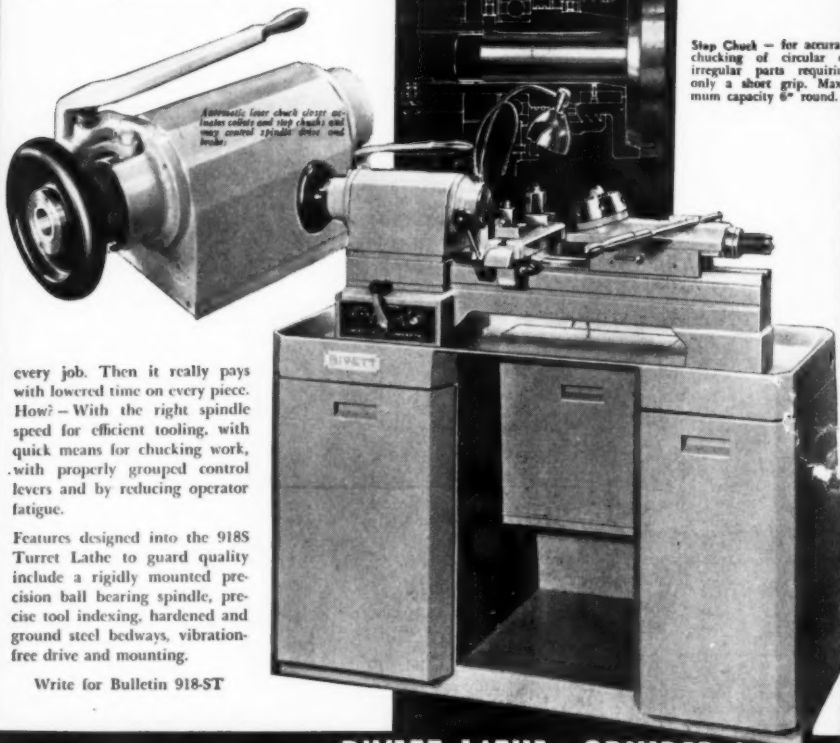
If you machine small and medium sized parts from bar stock or on second operations—look to this new Rivett Turret Lathe. It is designed to buy its way into your plant with cost savings and quality control.

The 918S Turret Lathe cuts the initial cost of investment by taking work from larger machines. It follows by reducing the "dead time" of set-up and spoilage on

**Stationary Collet** — clow without lateral movement to maintain perfect length on bar stock. Maximum capacity  $\frac{1}{4}$ " round.

**Draw-In Collet** — new design holds work truer with greater gripping power. Maximum capacity  $1\frac{1}{4}$ " round.

**Step Chuck** — for accurate chucking of circular or irregular parts requiring only a short grip. Maximum capacity 6" round.



every job. Then it really pays with lowered time on every piece. How? — With the right spindle speed for efficient tooling, with quick means for chucking work, with properly grouped control levers and by reducing operator fatigue.

Features designed into the 918S Turret Lathe to guard quality include a rigidly mounted precision ball bearing spindle, precise tool indexing, hardened and ground steel bedways, vibration-free drive and mounting.

Write for Bulletin 918-ST

**RIVETT LATHE & GRINDER, Inc.**

BRIGHTON • BOSTON • MASS. • U.S.A.

Photo Courtesy of United Air Lines



## IT TAKES SOMETHING EXTRA TO BE A *Specialist!*

There's a wealth of exacting experience behind an airline pilot! There's an equally important background of expert engineering, modern production and skilled manufacturing behind all special and standard BATH ground thread taps — toughened by hardening and tempering — then skillfully ground from the solid!

A special BATH process completely hardens the tap to uniform structure before threading. That's why BATH ground thread taps wear longer . . . retain their accuracy longer . . . save your production costs! Let our representative help with your tap problems . . . or write direct.

# JOHN BATH CO.

INCORPORATED

14 Grafton Street  
WORCESTER 8, MASS.

GROUND THREAD TAPS • PLUG AND RING THREAD GAGES • INTERNAL MICROMETERS

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

# **ARMSTRONG** *Drop Forged* **EYE BOLTS**



**They'll  
Carry the Load**

Specify ARMSTRONG Drop Forged Eye Bolts for extra strength — correctly engineered proportions, forged-in quality, uniformity of design in all sizes and the best mild steel, heat treated to increase tensile strength.

Built to tool standards, not hammered out as "tonnage" forgings, they always carry their load safely. Stocked by Armstrong distributors with or without shoulders, threaded or as blanks, in 13 sizes (Openings from  $\frac{1}{4}$ " to  $3\frac{1}{2}$ " I.D.)

## **ARMSTRONG BROS. TOOL CO.**

*"The Tool Holder People"*

308 N. Francisco Ave.

Chicago 12, U. S. A.

Eastern Warehouse and Sales: 199 Lafayette St., New York 12, N. Y.  
Pacific Coast Whse. and Sales Office: 1275 Mission St., San Francisco 3, Calif.



Published Monthly

Volume 43, No. 12

# Machine and Tool BLUE BOOK

**William F. Schlotcher**  
Editor

**C. M. Feeney**  
Department Editor

**H. L. Purdy**  
New Equipment  
Editor

**R. C. Van Kampen**  
President

**J. E. Hitchcock**  
Vice President

**M. L. Yonts**  
Secretary

**Vincent C. Hogren**  
Business Manager

**Robert R. Hadley**  
Art Director

**C. E. Elzinga**  
Circulation Manager

## DECEMBER, 1947

Featured in this issue.....	127
As the Editor Sees it.....	129
Carbide Sheet Metal Dies.....	133
By Earle Glen	
Factors Which Influence Surface Quality of Zinc Base Die Castings.....	143
By A. W. Sundwick	
Roto Finishing Method for Processing Metals.....	158
By C. H. Castle	
Letter from England.....	169
Salient Features of Handwheel Design.....	178
By H. F. Williams	
National Tool & Die Manufacturers Meet.....	192
Precision Measurement.....	198
By Warren Baker	
What's New in Metalworking.....	211
This Month's Industrial Films.....	292
New Technical Books.....	295
News of the Industry.....	297
Available Literature.....	301
Shop Hints.....	308
Mechanics Through the Ages.....	340
Products Index.....	342
Index to Advertisers.....	350



### District Managers

**New England and N. Y. State:** W. E. Hoffman, Portland, Conn., Phone 2946

**New York, Metropolitan Area:** A. E. Wailes, 55 W. 42nd St., New York 18, N. Y.  
Phone Lackawanna 4-4528

**Pennsylvania and South Atlantic States:** E. A. Dunhom, 6488 Lawnton Street,  
Philadelphia 28, Pa., Tel. Roxboro 8-1189-J

**Michigan:** John A. Wright, 8630 W. Outer Dr., Detroit, Mich., Tel. Kenwood 2-6140  
**Ohio, Indiana, Kentucky:** H. J. Smith, 6130 Webbland Place, Pleasant Ridge,  
Cincinnati 13, Ohio, Jefferson 6606

**Middle West:** James C. Stewart, Otto Highfield, 542 S. Dearborn St., Chicago 5, Ill.

**Pacific Coast:** R. H. Deibler, 2506 W. 8th St., Los Angeles 5, Calif. Phone  
Federal 0303

(Copyright 1947, by Hitchcock Publishing Co., Chicago 5, Ill.)

Phone: HARrison 6040

Cable Address: HITCHPUB

# THIS SAFE LUBRICANT PREVENTS SCORING

use



*Anti-Scoring*  
**LUBRICANT**

Whether you use it on a center or a tool post screw, you will be convinced CMD Anti-Scoring Lubricant is a safe, sure, economical lubricant to use. It withstands pressures of more than 50,000 pounds per square inch and prevents any metal to metal contact.

Why not send for a test sample today? Your own test will prove it best.



MAIL COUPON FOR **FREE** SAMPLE

**CHICAGO MANUFACTURING & DISTRIBUTING CO.**

Dept. 12BB, 1928 West 46th St., Chicago 9, Ill.

Without obligation, please send us a free sample kit of one tube of CMD Center Point Lube and one tube of CMD Center Point Oil. Also, send Catalog describing CMD Helical Groove Centers.

NAME.....

FIRM NAME.....

ADDRESS.....

# We've made the "ROUNDS" for 60 years

*Perhaps OUR experience  
can help YOU!*

Yes, for more than a half century, Gisholt has specialized in the field of round and partly round parts . . . building equipment to produce them . . . helping others to use it most efficiently.

Gisholt engineers concentrate on these machine shop problems, visiting hundreds of plants each year to help solve hundreds of problems. They will gladly help you.

If you have operations in your plant which you think might be improved, we invite you to make use of this experience through the Gisholt Round Table—a clearing house for practical ideas.

Now, and in the years ahead, more emphasis than ever will be placed upon better methods, increased efficiency and lower costs. Be sure you have the best methods and equipment. It pays to "Look ahead—keep ahead—with Gisholt."

## GISHOLT MACHINE COMPANY

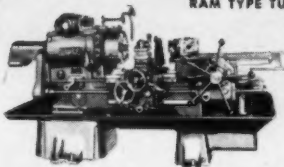
Madison 3, Wisconsin



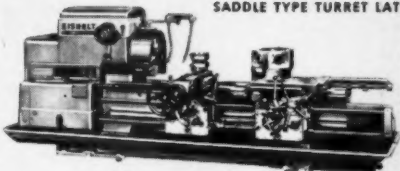
### The GISHOLT ROUND TABLE

*represents the collective  
experience of specialists  
in the machining, surface-  
finishing and balancing  
of round and partly round  
parts. Your problems are  
welcomed here.*

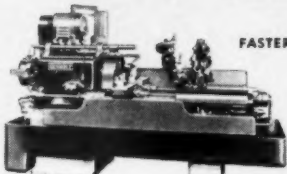
RAM TYPE TURRET LATHES



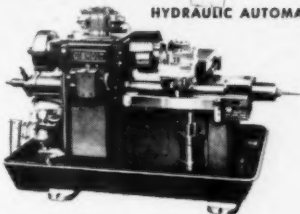
SADDLE TYPE TURRET LATHES



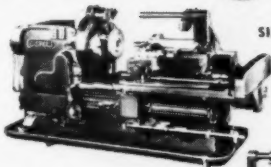
FASTERMATIC



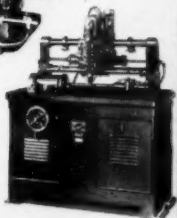
HYDRAULIC AUTOMATIC LATHES



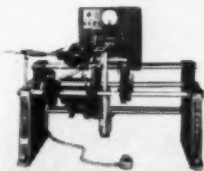
SIMPLIMATIC



SUPERFINISHERS



BALANCERS



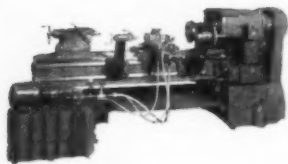
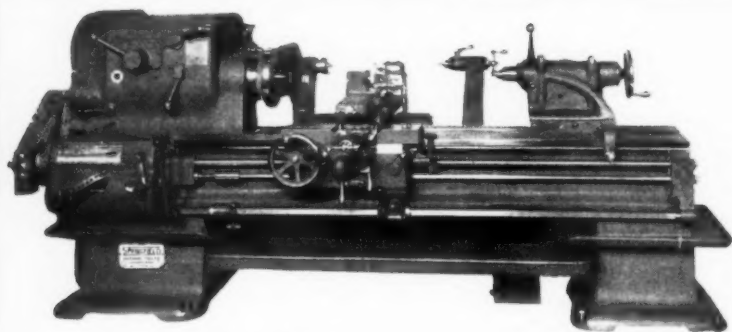
**VERSATILE HYDRAULIC PRO-  
FILING-DUPLICATING MACHINE**

# SPRING

This SPRINGFIELD machine will duplicate almost any job from bottle moulds to cam forms. Illustrated as an integral part of a Springfield 20" lathe. Other sizes are available. Any type of template can be used with this very versatile SPRINGFIELD DUPLICATING MACHINE.

It has twelve spindle speeds and further speed reduction by a special two-speed, gear box. The hydraulic pump unit is separate and may be located in any convenient position. Your operator has a clear view of the cutting tool while operation is in progress.

The SPRINGFIELD DUPLICATING MACHINE is also adaptable for regular lathe work.



◆ BACK VIEW

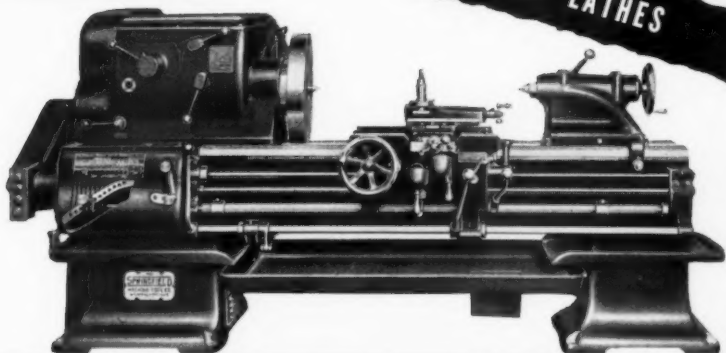
◆ FRONT VIEW

## The Springfield

**SPRINGFIELD, OHIO, U. S. A.**

# FIELD

HEAVY DUTY GEAR  
HEAD LATHES



TOOL ROOM LATHES are equipped with Lead Screw Reversing Mechanism, producing right and left hand threads and feeds controlled by lever at right hand side of Apron with automatic stops for both Lead Screw and Feed Rod. Oil Pan is also included as regular equipment.

Extreme accuracy and long life are maintained in SPRINGFIELD LATHES by the deep, well ribbed bed made from High Test Nickel Chrome Gray Iron. These beds, are made in our own Foundry and, after exhaustive metallurgical and wear tests by professional laboratories, and practical tests in the field, this material has proven itself to be the best for use in lathe beds. It gives greater wear resistance, freedom from scoring, and freedom from internal strains, which factors all result in greater accuracy throughout the life of the lathe.

The direct reading Gear Box is tongued, grooved and bolted to front of bed and is the enclosed type to exclude dirt and chips from gears. Wide gears and heavy shafts are used with Ball and Bronze Bearings throughout. Thirty-six (36) changes of threads and feeds are obtained, and in connection with the Reverse Gears, either right or left hand threads can be produced without the use of wrenches.

## Machine Tool Co.

SEND TODAY FOR BULLETIN 116

WRITE US FOR  
MORE INFORMATION

SPRINGFIELD, OHIO, U. S. A.

# THE CONE AUTOMATIC MACHINE COMPANY



SEE MARY

**GOOD THINGS AHEAD**

## It is reported that . . . . .

Helicopters made by Bell Aircraft were recently used to spray swarms of flying locusts in South America. A 98% kill was reported.

*get ready with CONE for tomorrow*

The Naval Research Laboratories are "growing" artificial quartz crystals for use in electronic devices.

*be ready with CONE for today*

The U. S. Bureau of Standards has developed a method of plating with nickel or cobalt that requires no electric current.

*get ready with CONE for tomorrow*

A magnified chart showing the shape, height and spacing of long waves, steps, fine roughness and other irregularities on machined or finished surfaces is provided by the Proficorder — a new Physicists Research Co. shop instrument.

*be ready with CONE for today*

Air speeds up to 7,000 miles per hour can be simulated for study by towing models at much slower speeds in a shallow tank of water. The method is in use in North American Aviation's Aerophysics Laboratory.

*get ready with CONE for tomorrow*

Goodyear Tire and Rubber Co. cements automobile brake linings directly to the brake shoes eliminating rivets. More surface is provided and longer wear without scoring results.

*be ready with CONE for today*

Fibrous insulation composed of pure silica and capable of withstanding 2,000 deg. F. is being made by H. I. Thompson Co. of Los Angeles.

*get ready with CONE for tomorrow*

Photographic prints produced in a specially equipped automobile immediately after exposure were transmitted by radio to the editor's desk at the New York Daily Mirror eight minutes after the event pictured.

American-La France-Foamite Corp. is making a two-car parking meter which halves the cost of installation.

*be ready with CONE for today*

Color printing by radio facsimile is now possible with a process called "Colorfax" developed by Finch Telecommunications Inc.

*get ready with CONE for tomorrow*

The underground gasification of coal for the commercial production of power has been proved feasible by the Alabama Power Co.

*be ready with CONE for today*

The Automatic Signal Division of Eastern Industries, Inc. has a device for measuring the speed of vehicles in traffic that is based on the reflection of a radio wave from the surface of a moving vehicle.

Pennsylvania Railroad is using a mobile X-ray machine to examine metals in locomotives, cars, rails and other equipment.

*get ready with CONE for tomorrow*

In California the Bakersfield Machine Co. sells welders' supplies directly from a truck to oil fields, farmers, factories and welding shops.

*be ready with CONE for today*

American Locomotive Co. has a waste-heat boiler that operates on diesel engine exhaust.

*get ready with CONE for tomorrow*

A small air-driven drill made by Aro Equipment Corp. has a 1/4-inch chuck and turns 26,000 r.p.m.

*be ready with CONE for today*

Fruehauf Trailer Co. is making prefabricated truck bodies that can be assembled by the dealer in a few hours.

FOLLOW THESE PAGES FOR NEWS OF PROGRESSIVE PRODUCTION

# Can YOU equal this



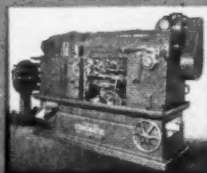
## in 12 seconds?

The above shaft was machined by a 1 1/2" 8-Spindle Conomatic in 12 secs., with 16 tools, from SAE 1030 — 1/4" rd. stock.

Ask your CONE representative to show you our new color motion picture

# CONE

AUTOMATIC MACHINE CO., INC. ★ WINDSOR, VERMONT, U.S.A.



46



\* A Hogging Demonstration

# HOGGING!


No shaper hogs off metal without power at the cutting tool or without rigidity or without an overall ability to stand the gaff.

Cincinnati Heavy Duty Shapers, outstanding for many years in power, stamina and sustained performance, are today more powerful and more rigid than before.

The reliable performance of Cincinnati Heavy Duty Shapers means profit in the shop.

Write for catalog N-3 on the complete line of Cincinnati Shapers.

\*This Cincinnati Heavy Duty Shaper operated for the 10 days of the Machine Tool Show on a 2" depth of cut, .030" feed, and nine strokes per minute—in 1020 Steel to show the remarkable cutting capacity and rigidity of Cincinnati Shapers.



Watch for our example  
of the PROFITABLE  
VERSATILITY of  
**CINCINNATI  
SHAPERS**

## THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS • SHEARS • BRAKES

*ONCE AGAIN --  
Your Industrial Distributor*



*Jacobs* BALL BEARING  
SUPER CHUCK

Here's the fast and easy-working anti-friction model that cuts down set-up time. It is the finest chuck in the famous Jacobs line. Latest refinements include (1) an inserted ball thrust race with continuous deep groove (2) a heat treated alloy steel nut giving four times the load carrying capacity of former construction. Smoother in operation — sturdier than ever — the "N" Series Super Chuck is the last word on heavy duty production work.

TOOL UP YOUR TOOLS WITH NEW *Jacobs* HIGH-ACCURACY

# *Can Deliver Jacobs Chucks from Stock!*



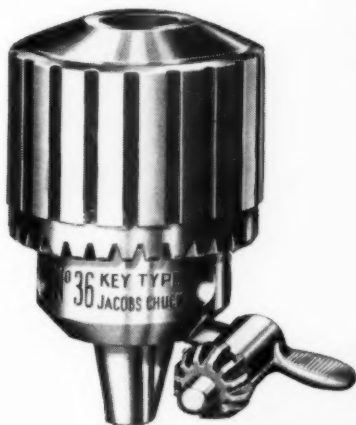
Excessively worn or damaged chucks can cause —

- Drill Slippage
- Drill Breakage
- Inaccurate Holes

Replace your old chucks now — to prevent wasted man hours and material. Your industrial supply distributor has new Jacobs Chucks in stock.

## *Jacobs* PLAIN BEARING CHUCK

For light and medium duty requirements here's a lot of chuck at very moderate cost. Maximum strength, accuracy and powerful grip have been carefully built into it. Latest improvements include (1) fluted sleeve internally ground on three diameters (2) nickel molybdenum alloy steel jaws expertly heat treated (3) precision bored taper hole in hardened and ground body. The largest selling drill chuck in the world . . . the unanimous choice of portable tool manufacturers.



*Chucks* SOLD EXCLUSIVELY BY INDUSTRIAL DISTRIBUTORS

THE JACOBS MANUFACTURING CO., HARTFORD 2, CONNECTICUT



## Easy-to-Handle TUMICO SNAP GAGE Quickly Measures 15" Ground Shoulder Diameter

Light Tubular Steel Frame Permits "Feather Touch" Feel for Accurate Gaging of Forged Gear Hub O.D. During Grinding Operation.

Through the use of this Tumico Snap Gage, overall measuring time is sharply reduced. Gaging the ground shoulder O. D. is as simple as shown in the illustration. Machine operator merely "feels" for  $\pm .001$  dimension and is assisted by light tubular frame structure which is 25 to 30% lighter than solid frame snap gages.

These precision instruments will cut your measuring time and improve work quality. Take advantage of Tumico standard snap gages from 5½" to 24" or special sizes to suit requirements.

### MORE TIME SAVING—PROFIT PRODUCING TUMICO PRODUCTS FOR YOUR NEEDS.



**1. Tumico Caliper and Wire Gage** is a combination measuring instrument. It will measure sheets and plates from 0" to 4". Wire gage slots are U. S. Standard No. 1 through No. 30. Markings are deep etched for rapid reading.



**2. Tumico Tubular Micrometers** feature "feather-touch" feel for making repetitive precision measurements. They are available in the

Series T fixed anvil type in size 0" to 30" and in Series M mandrel type in sizes from 0" to 96" both in sets or combination. Embodied in these micrometers are such important structural features as hardened and ground spindles, ground and lapped spindle threads, special alloy steel vacuum sealed frames, triple plated with copper, nickel and chrome and easy to read numerals.



**3. Tumico Vernier Height Gages** quickly measure and scribe off vertical distances from a plane surface. Beam and vernier are scientifically calibrated and deep

etched for clear, easy reading. This gage is indispensable in the tool shop when precision measurements must be maintained.



**4. Tumico Thrift Micrometers** are economically priced units having drop forge steel frames, hardened anvils and spindle tips. They are available with ratchet stop and lock ring, or Vernier scale in size 0" to 6".

### Write Today

—for further information about Tumico Precision Measuring Instruments for all standard and special requirements.

**TRADE  
TUMICO  
MARK**

**TUBULAR MICROMETER CO.**

MILWAUKEE BRANCH  
ST. JAMES, MINNESOTA, U.S.A. PLANKINTON BLDG.

# Tops in Tapping

## Jarvis TORQOMATIC



The new torque-driven tapper is the most modern, efficient and productive tool of its kind on the market. Performance in your shop will confirm this fact. The Torqomatic is ultra-sensitive, will tap from soap to nickel steel with finger tip pressure. It increases number of tapped holes per hour, adds life to taps and is a new pleasure for the operator. Available in standard and built-in models.

Write for fully descriptive Catalog TMT-1. A Jarvis representative will welcome the opportunity to demonstrate the Torqomatic.

## Jarvis-Dowding TAPS

For maximum performance under tapping conditions prevailing in your shop, make your next tap order read "Jarvis-Dowding" . . . custom finished taps, designed to meet your demands. "Jarvis-Dowding" Taps cut more threads with less power, require minimum sharpening and provide greater dependability on the job.

Write for Bulletin JD-101 for more details.

## Jarvis POWER TOOLS

THE CHARLES L. JARVIS CO., MIDDLETOWN IN CONNECTICUT

Rotary Files • Flexible Shaft Machines • Taps and Dies  
Quick Change Collets and Chucks • Tapping Attachments

The most Versatile, Practical

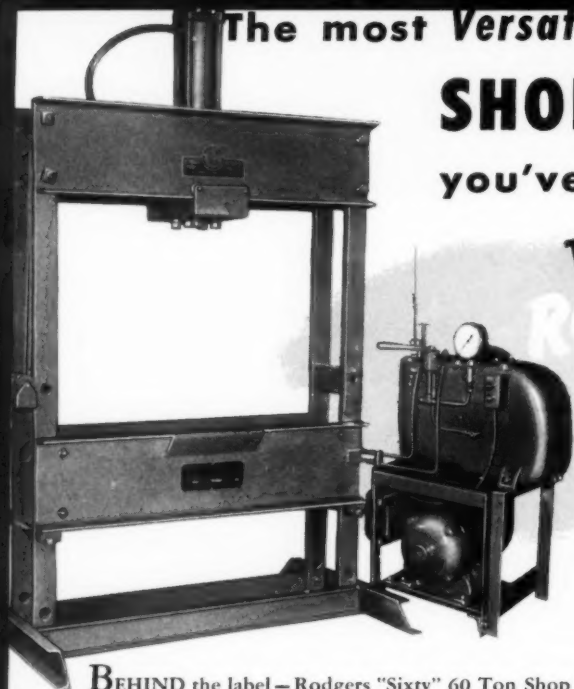
# SHOP PRESS

you've ever seen

THE

Rodgers

"Sixty"

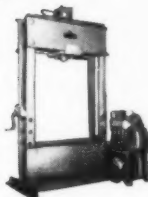


**BEHIND** the label—Rodgers "Sixty" 60 Ton Shop Press with power driven hydraulic pump—is a flexible, highly efficient production unit that will prove invaluable in taking care of those many miscellaneous time and labor consuming jobs. Powered with the Rodgers "D" pump and newly-designed four-way valve, it has all of the desirable features of a streamlined press for general shop use where pressures up to sixty tons are required.

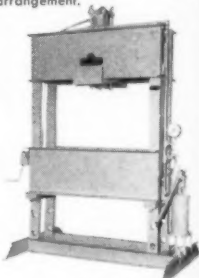
Outstanding features include: An 8" opening between columns permitting long work to be slid through either end of press without obstruction; ram and cylinder may be moved into various positions in the press without changing placement of work; bottom bolster can be raised or lowered easily with a hand crank; and V-blocks for innumerable uses in any position on the bolster. Power pumps are available with or without four-way valve—and in manual or solenoid control.

The "Sixty" is but one of Rodgers series. Standard shop presses are available in 100, 150 and 200 ton sizes, with 300 and 400 tons capacity presses made to order. All include the same proved Rodgers design and performance features. All are rugged, durable, flexible and versatile.

There is a Rodgers Shop Press exactly suited for your needs in any tough service and maintenance work in pressing, squeezing and forcing. Prompt delivery on standard models.



Rodgers 150 ton Stationary Shop Press with hydraulic "D" pump and four-way valve arrangement.



Rodgers 100 ton Stationary Shop Press with 4-speed, hand-operated hydraulic pump.

Send today for your copy of the "Rodgers Hydraulic Shop Presses" catalog. It gives complete descriptions, illustrations and specifications of the various models.

## Rodgers Hydraulic, Inc.

HYDRAULIC POWER EQUIPMENT  
7453 Walker Street,

St. Louis Park, Minneapolis 18, Minn.



Portable Presses





## **Faster Cutting, Longer Tool-Life, Reported for the New Sun Cutting Fluids Containing No Animal or Vegetable Fatty Oils**

Since Sun recently announced the new grades of Sunicut with Petrofac, favorable performance reports have been coming in on practically every kind of metal-cutting job.

**Higher cutting speeds**, longer tool-life, increased production, better finish, performance superior to that of cutting oils previously used . . . these are the "Job Proved" results being reported.

**"10% increase in tool-life** on our automatics" . . . "chaser-life increased 50% on pipe-threading machines" . . . "finer finishes" . . . "best cutting oil I have ever used" . . . say typical reports from customers.

**No animal or vegetable fatty oils** go into the new Sunicut grades. The

Petrofac used in compounding is entirely derived from petroleum. The new Sunicut Cutting Oils with Petrofac possess superior metal-wetting and anti-welding properties, as well as unusual extreme-pressure characteristics.

**Sunicut with Petrofac** will not turn rancid. It is available in plentiful supplies and at reasonable, stable prices. Call in your Sun Cutting Oil Engineer for full information, or write Department MT-12.

## **SUN OIL COMPANY**

**Philadelphia 3, Pa.**

*"Makers of the well-known Sunoco Emulsifying Cutting Oil"*

In Canada: Sun Oil Company, Ltd. - Toronto and Montreal

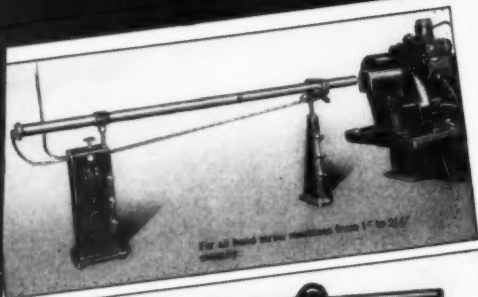
**SUN INDUSTRIAL PRODUCTS**

\*Petrofac is a trade-mark of Sun Oil Company

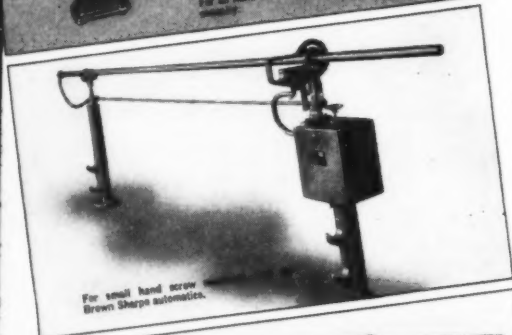


# IN ONE FEED-OUT

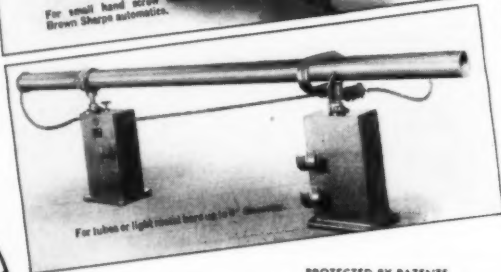
can you feed any desired length  
up to full length of stock?



For all hand screw machines from 1" to 20"



For small hand screw  
Brown Sharpe automatics.



For tubular or light metal bar up to 6"

## LIPE

### PNEUMATIC BAR FEEDS

*Will do it!*

LiPe Bar Feeds make long feed-outs possible. The piece is not grabbed by feed fingers; instead, it is pushed automatically by an air driven piston.

Feed-fingers and feed-finger mechanisms are eliminated entirely, yet these Bar-Feeds will feed any required distance right up to the smallest end-piece. This is done without marring, scratching, or deforming. A fast, safe method that steps up production, saves spoilage!

**LiPe Bar Feeds Are Made For Any Type Machine Where Stock Is Fed Through A Spindle.**

You can get a LiPe Bar-Feed for your automatic or hand-operated screw machine, however small or large it may be.

**WRITE or CALL US  
TODAY!**

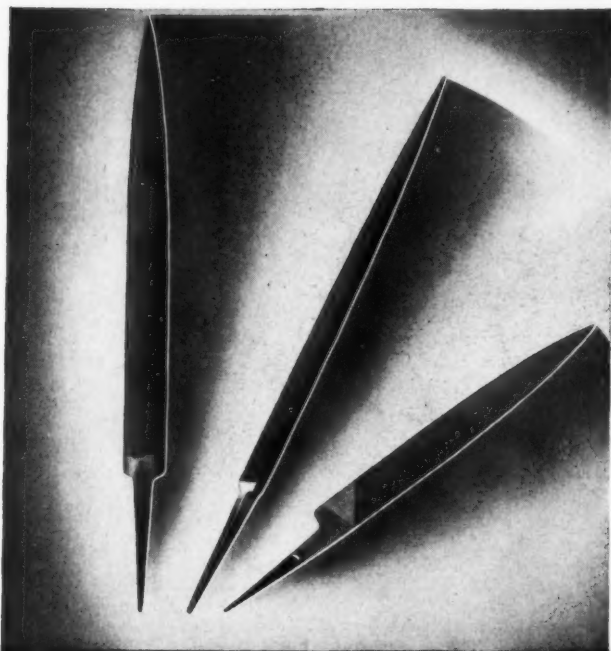
for complete descriptions and engineering data on the LiPe Pneumatic Bar Feeds. No charge or obligation, of course.

PROTECTED BY PATENTS



**LiPe-ROLLWAY CORPORATION, Syracuse 1, N. Y., U.S.A.**

Cable Address: LIPEGAR



*Grobet*  
PRECISION  
**SWISS FILES**

**THE ORIGINAL — YET THE MOST MODERN**

**OVER  
5,000  
SHAPES  
and  
SIZES  
CHROME  
STEEL  
*Precision*  
SWISS  
FILES**

**Send for  
Pocket  
Catalog SF**



TODAY MORE THAN EVER YOU GET MORE VALUE FOR YOUR MONEY AND YOU GET THE FILE YOU NEED FOR A SPECIFIC PURPOSE — no substitutes, no "near as good." That's why more and more are exclusively using GROBET Chrome Steel SWISS FILES — the oldest name in files, and the undisputed leader where precision is demanded.

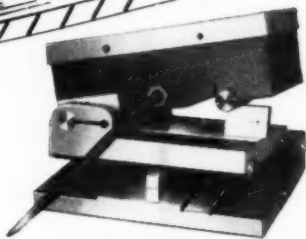
**GROBET FILE CO. OF AMERICA, INC.**  
421 CANAL STREET NEW YORK 13, N. Y.

# Accurate ANGULAR SET-UPS



The Magna-Sine is built in two styles; one for single and compound angles, the other for single angles only. Each style is available in two sizes. The work, held by magnetic attraction, is clamped or released instantly.

Robbins Engineering Company, 318 Midland Avenue, Detroit 3, Michigan.



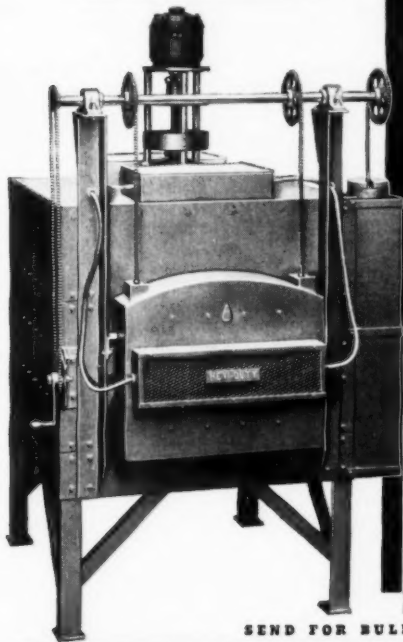
 **Robbins**  
ENGINEERING COMPANY

PRODUCERS OF ROBBINS MAGNA-SINE • ROBBINS UNIV-ANGLE  
ROBBINS SINE PLATE • ROBBINS INDEX TABLES  
ROBBINS No. 3 DRILLMATIC • SPECIAL MACHINERY

# *The Chief Advantages* OF THE **HEVI DUTY** *Multi Range* **CONVECTION FURNACES** *Box Type*

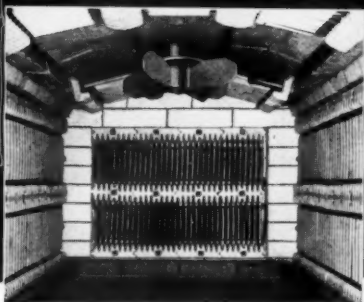
400° F TO 1850° F

Type H D - 243618 - A - 40 K W  
Rating. A Multi Range Convection Furnace used for heat treatment of LOCOMOTIVE SPRINGS.



- Are*
- ✓ USE OVER A WIDE RANGE OF TEMPERATURES WITH
  - ✓ HIGH DEGREE OF UNIFORMITY
  - ✓ USE WITH OR WITHOUT FAN AGITATION
  - ✓ WITH OR WITHOUT PROTECTIVE ATMOSPHERE
  - ✓ PLAIN OR ROLLER RAIL HEARTH

*Below:* Interior view of a Multi Range Convection Furnace.



SEND FOR BULLETIN HD 341

**HEVI DUTY ELECTRIC COMPANY**

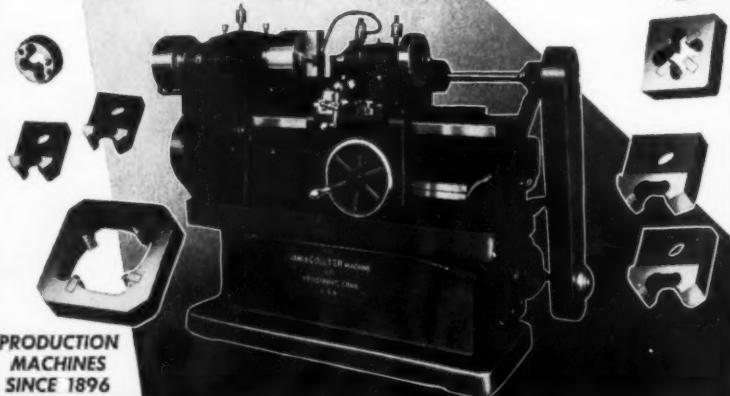
HEAT TREATING FURNACES **HEVI DUTY** ELECTRIC EXCLUSIVELY  
MILWAUKEE, WISCONSIN

# ★ 4 BIG REASONS WHY

the Standard COULTER "HT" Thread Milling Machine  
IS THE MACHINE FOR YOU!

- ★ Any number of Lands eccentric or con-eccentric relief can be produced. Dies from  $\frac{3}{8}$ " up to 2"
- ★ Equipped to give cutter speeds with infinite changes from 100 RPM to 650 RPM
- ★ Can thread round, square and inserted chaser dies
- ★ The most economical of ALL threading machines

Write for Full Particulars



PRODUCTION  
MACHINES  
SINCE 1896

*The James* **COULTER** *Machine Co.*  
BRIDGEPORT • CONNECTICUT • U.S.A.

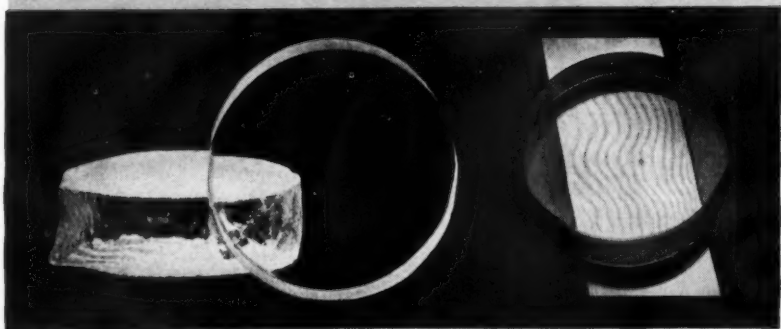
Ultimate Accuracy

## IN PRECISION CHECKING OF GAGES AND LAPPED PARTS

assured by

*Van Keuren*

# FUSED QUARTZ OPTICAL FLATS



The use of optical flats for precision measurements with light waves was pioneered by The Van Keuren Co. in 1920. The new Van Keuren double surface, pure fused-quartz flats are the result of 25 years of experience. The accuracy and workmanship is superlative.

Fused quartz is highly transparent and has exceptional wearing qualities. The expansion and contraction due to temperature change is  $1/16$  that of plate glass and  $1/6$  that of pyrex.

Specify Van Keuren double surface, fused-quartz optical flats for checking flatness of precision lapped parts, maintenance of amplifying gages, and control of gage block wear. They are the most economical to purchase and the most accurate to use.

Worn spot .000023" deep revealed an amplifying gage envil by means of a Van Keuren optical flat.



Consult the 160-page Van Keuren Catalog No. 33 for further details. Send for your copy.

THE *Van Keuren*  
28th YEAR

CO., 177 WALTHAM STREET,  
WATERTOWN, MASS.

Light Wave Equipment • Light Wave Micrometers • Gage Blocks • Taper Insert Plug Gages • Wire Type Plug Gages • Measuring Rolls • Thread Measuring Wires • Gear Measuring System • Shop Triangles • Carbide Plug Gages • Carbide Measuring Wires

# NEW

## -DIFFERENT-BETTER-



■ That's the Ingersoll-Rand KRVS sidewall-mounted centrifugal pump, for coolant service. All the features found in our horizontal KRVS pump construction are incorporated in this pump ... these include ease of mounting, compactness, built in mechanical seals and grease sealed ball bearings.

■ Motor sizes are available from  $\frac{1}{4}$  to 1 horsepower with totally enclosed motors. Some sizes are available with explosion-proof motor.

■ If you are considering a new pumping unit or the replacement of your present one, be sure to specify Ingersoll-Rand. Your nearest I-R branch office or your local I-R distributor can give you complete details.

# Ingersoll-Rand

11 Broadway, New York 4, N. Y.

17-9A

# GRAND RAPIDS GRINDING MACHINES



*Grand Rapids Combination  
Tap & Drill Grinder No. 10-B*

## DELIVER TOP TOOL ROOM EFFICIENCY

Whether you need a Universal Cutter and Tool Grinder or a Combination Tap and Drill Grinder, you can be sure of top tool room efficiency if they bear the name "Grand Rapids" manufactured by Gallmeyer & Livingston Co.

With the Combination Tap and Drill Grinder you save three ways: 1. On first cost, 2. Through lower maintenance expense, 3. On valuable floor space.

With Grand Rapids No. 60 Universal Cutter and Tool Grinder you can handle complex tool grinding jobs with maximum speed and convenience.

**Write for descriptive bulletins**

GL 8-46 describes the No. 10-B

2-28-46 describes the No. 60



*Grand Rapids No. 60 Universal  
Cutter and Tool Grinder*

**What "GRAND RAPIDS" Quality Means:** Gallmeyer & Livingston cast their close-grained gray iron, machine to micrometric tolerances, precision-assemble grinding machinery of unsurpassed performance. *Grand Rapids* means top quality in grinding machinery.

**GALLMEYER & LIVINGSTON COMPANY, 405 STRAIGHT ST., S. W., GRAND RAPIDS 4, MICH.**

# Send your FORM-TOOL specs to *J&S*

If you need form-tools in any quantity, it will pay you to use our form-grinding service. We do a large volume of this work for many of the leading manufacturing concerns.

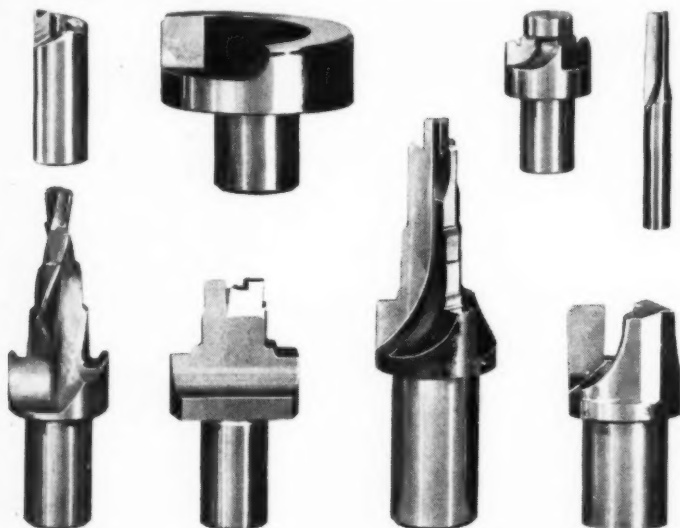
Our wide experience has developed in us a "tool sense" that enables us to read between the lines of form tool specifications and "grasp the idea" behind them.

J & S equipment of exclusive design, reducing man hours required to form-

grind spiral tools, enables us to turn out these difficult tools at attractive prices.

Among the form-tools we produce are: counterbores, cold-heading dies, counter-sinks, taper reamers, gun drills, flat drills, end cutters, boring tools, step drills, hollow mills, recess tools and combination tools. We also produce small form-tools for manufacturers of watches, clocks, meters and instruments.

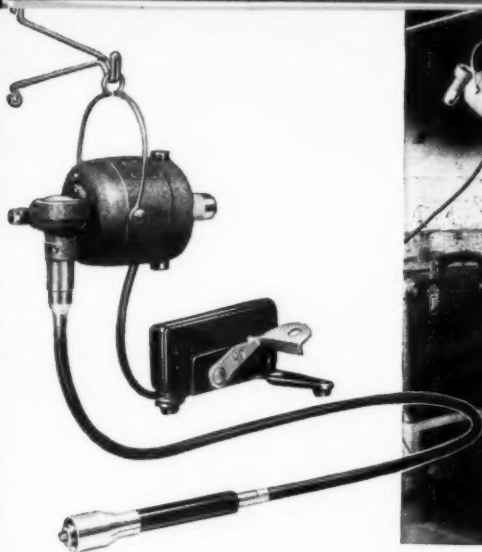
Send us your form-tool specs for quotation.



## *J&S* TOOL CO.

475 Main Street, East Orange, N. J.

Representatives in Principal Cities



Universal motor, 1/15 H.P. 2 output shafts, 12 speeds—500 to 10,000 rpm with foot rheostat, both hands free. Three hand pieces available, from fountain-pen size to 1" diameter; capacity 0 to 1/8" shank.



## How to Lick Hard-to-Reach Jobs — use a Dumore Flexible Shaft Tool!

Every shop has dozens of hard-to-reach jobs — awkwardly located, or inaccessible to bulky hand tools. A maneuverable Dumore Flexible Shaft Tool is the perfect solution.

Particularly adapted to the finishing of small openings in all types and kinds of dies; to grinding and filing deep inside castings and assemblies. You can chuck many types of

tools in the three available hand-pieces, for countless other operations such as burring, routing, drilling, sawing, and polishing. Yes — you can *really* do more with a Dumore!

Simplify your work with dependable Dumore Flexible Shaft Tools. Write for complete information today. The Dumore Company, Department M-27, Racine, Wisconsin.

G-11

Sold by  
leading industrial distributors  
in all principal cities.

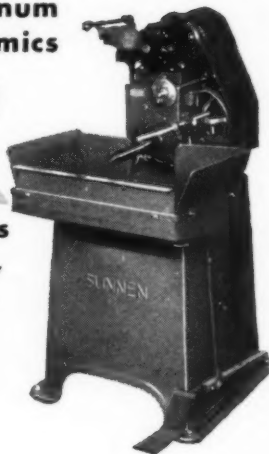
**DUMORE**

RACINE, WISCONSIN

For Accurate Holes in Steel . . .  
Cast Iron . . . Bronze . . . Aluminum  
Carbides . . . Glass or Ceramics

## THE SUNNEN PRECISION HONING MACHINE

Saves Set-Up Time, Increases  
Production, Reduces Rejects,  
Holds Tolerances to .0001".



### Typical Jobs



Sunnen Precision Honing Machine produces uniformly smooth accurate hole in glass part.



Bronze Valve. The Sunnen method of honing is used to secure a high finish and accuracy.



A straight round hole was produced in ceramic material.



Hydraulic Two-Way Control Valve. Hole is honed to eliminate leakage.



Drawing and Blanking Die. "Saves time in producing smooth base metal finish."

**R**eal savings in long run production costs—even greater savings on job lots and short runs when frequent size changes are necessary; can be set up quickly and easily; produces straight round holes with full bearing surfaces in any hole from .120" to 2.625" in diameter. Duplicates sizes quickly and easily. Removes burrs and flash from drilled, machined, cast or punched parts. Easy to operate—no jigs or fixtures. Low in cost, economical to operate.

Write for bulletin giving complete information.



### SUNNEN PRODUCTS COMPANY

7935 Manchester Avenue • St. Louis 17, Mo.

Canadian Factory: Chatham, Ontario

275

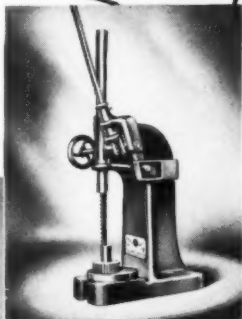
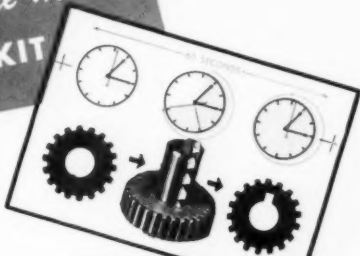
# HAND CUT YOURSELF A KEYWAY A MINUTE

In Gears, Pulley Hubs, Couplings, Collars,  
Milling Cutters, etc.

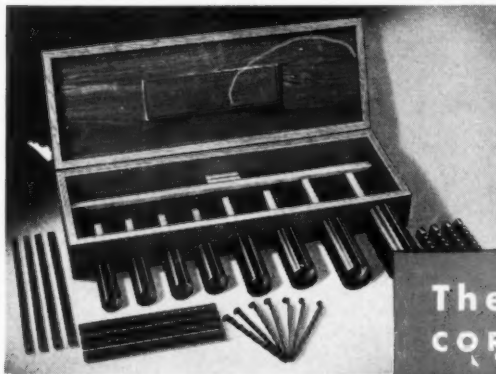
With du Mont's *Minute Man*  
KEYWAY BROACH KIT

Think of the time and trouble and money you'll save when you have this Minute Man Kit handy to cut keyways of any standard width, any depth. A few keyways jobs and the Kit has paid for itself.

Here's a set of fine tools that no shop can afford to be without. Deliveries are now being made from stock. A postcard with your name and company address will bring you the name of the nearest Mill Supply Distributor and a free copy of the new Minute Man Catalog, Price List and Reference Manual "T".



The du Mont Arbor Press is ideal for keyway broaching and other shop uses. It comes in sizes for 1, 3, and 5 ton pressure.



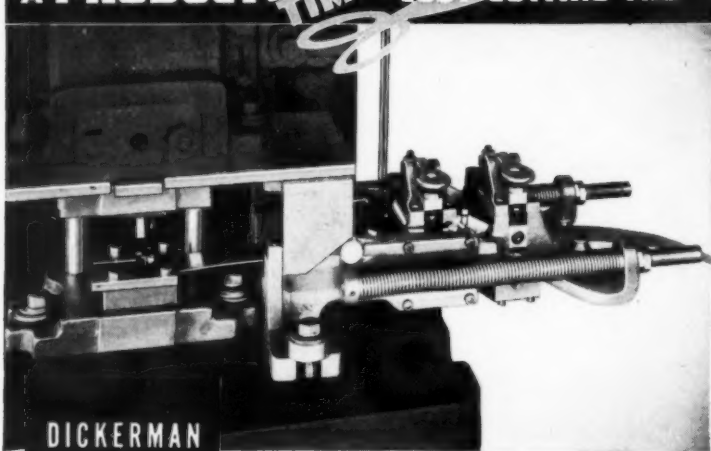
Kit contains everything you need to cut up to 32 different size keyways—precision broaches, bushings, shims, keyway stock.

**The du MONT**  
**CORPORATION**  
GREENFIELD, MASSACHUSETTS

**A PRODUCTO**

**TIMELY**

**COST CUTTING AID**



**DICKERMAN**  
*automatic*  
**DIE**  
**FEEDS**

### **Punch Press Feeding Simplified**

If you appreciate the factor of human error... as you do! And the cost of die repairs and wasted material... then you need automatic Dickerman Die Feeds that require no motor, no connection with the power shaft of the press. Used with Producto Die Sets they form a combination that will give years of trouble-free operation, feeding all coiled stamping materials, up to  $\frac{3}{16}$ " thick — 6" wide, accurately, without jams. Installed in any position for any style die. Call "Near Neighbor Service" for Bulletin.

**EXCLUSIVE DISTRIBUTOR FOR DICKERMAN AUTOMATIC FEEDS**

#### **NEAR NEIGHBOR** *Service*

**INDIANAPOLIS 2,**  
635 Fulton St.  
Lincoln 5385

**BALTIMORE 2, MD.,**  
L. A. Benson Co., Inc.  
Plaza 0340

**PHILADELPHIA 40, PA.**  
Wright & Gade Tool Co.  
Radcliffe 5-1467

**BUFFALO 2, N. Y.**  
R. C. Neal Co., Inc.  
Cleveland 1110

**DETROIT 11,**  
3017 Medbury  
Plaza 3101

**SYRACUSE 2, N. Y.**  
R. C. Neal Co., Inc.  
3-1181

**CLEVELAND 14,**  
3200 Lakeside Ave.  
Prospect 4936

**ROCHESTER 4, N. Y.**  
R. C. Neal Co., Inc.  
Main 5249

**NEW YORK 12,**  
197 Lafayette St.  
Worth 4-7484

**LOS ANGELES 21, CAL.**  
Jamison Steel Corp.  
Trinity 9827

**SAN FRANCISCO 7, CAL.**  
Jamison Steel Corp.  
Exbrook 2230

**ELMIRA, N. Y.**  
R. C. Neal Co., Inc.  
5169

### **THE PRODUCTO MACHINE COMPANY**

**980 Housatonic Ave. • Bridgeport 1, Conn. • Tel. 4-9481**



**Keep Cutters Sharp  
With the ACE**

## **2 Models For All Cutter Sharpening**

### **Send For New Catalog**

The "ACE" Tool and Cutter Grinder has proven its worth in tool-rooms around the world — **GETS MORE PRODUCTION** — Cutters stay sharp longer . . . less down time for changes . . . **MORE ECONOMICAL** — the average life of a cutter is longer . . . fewer replacements. **MORE ACCURATE** — Cutters sharpened on the "ACE" have all teeth uniformly ground and all teeth cutting.

Use the "ACE" to keep reamers, end mills, side mills, spot facers and all kinds of special tools and cutters in like new condition.

**OLIVER INSTRUMENT CO.**

**1408 E. Maumee St. Adrian, Mich.**



**IMPROVE YOUR TOOLROOM  
IT'S THE BACKBONE  
OF PRODUCTION**

**OLIVER  
OF  
ADRIAN**

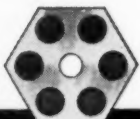
**PRODUCTS**

**OLIVER  
OF ADRIAN**

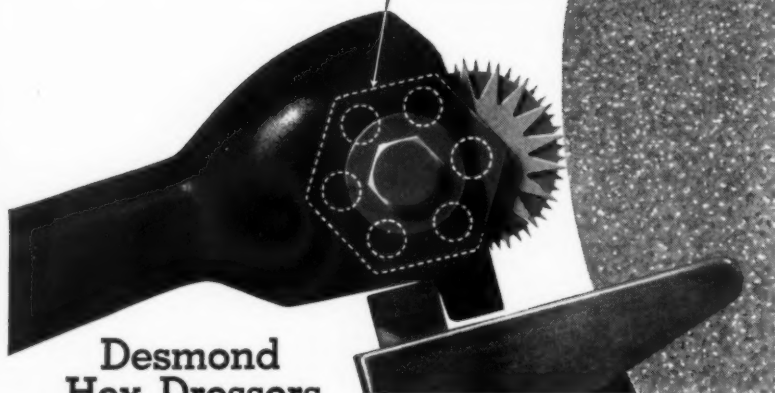
**AUTOMATIC DRILL GRINDERS  
TOOL & CUTTER GRINDERS—DRILL  
POINT THINNERS—TEMPLATE  
TOOL GRINDERS—FACE MILL  
GRINDERS—DIEMAKING MACHINES**

When Writing Advertisers Please Mention **MACHINE** and **TOOL BLUE BOOK**

**6** SETS  
OF BEARINGS



**6** TIMES THE SERVICE



## Desmond Hex Dressers

### Six-hole bearing blocks multiply service life

The Desmond Hex Dresser, with the six-hole hardened steel bearing blocks in the head, is the most durable mechanical dresser made. As one pair of holes wears, merely turn the block to a new set. No wear on the handle. When all six sets have been used, it's a simple matter to loosen the side screws, remove the cutter

assembly and replace the blocks. Made in five sizes and using Huntington cutters of corresponding size.

Desmond makes the only *complete* line of grinding wheel dressers on the market. To you, this means the right tool for every job . . . and, in turn, better performance and longer life from your grinding wheels. Write for the catalog of our complete line and the name of your nearest Desmond distributor.

The Desmond-Stephan Mfg. Co. • Urbana, Ohio

# Desmond

the only complete line of grinding wheel  
**DRESSERS & CUTTERS**



**BALL BEARING  
DRESSERS**



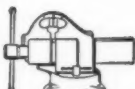
**REVOLVING  
CUTTER TYPE DRESSERS**



**DIAMOND HAND TOOLS  
AND NIBS**



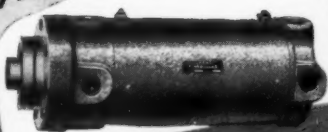
**WHEEL TYPE  
DRESSERS**



**SIMPLEX  
STEEL-SLIDE VISES**

MACHINE and TOOL BLUE BOOK

*This NEW,  
IMPROVED line  
will help you...*



for  
PUSHING PULLING LIFTING  
CLAMPING HOLDING PRESSING  
in any direction

For Product  
**IMPROVEMENT and ECONOMY**  
USE

# "LOGAN" ROTOCAST HYDRAULIC CYLINDERS

Take advantage of the new, modern-design ROTOCAST Hydraulic Cylinders... get fast-acting, positive, controlled power for many industrial applications. Clean, true bores in centrifugal-cast cylinder barrels result in a full, smooth, uniform power flow and lasting accuracy. Soft synthetic "O" ring seals are permanently leak-proof. No gaskets... no tie rods.

Standard ROTOCAST Cylinders are available in sizes from 2" to 8" bore, with any length of stroke up to 8 feet. 4 piston rod end types. For operating pressures to 1500 p.s.i.

**OIL OR WATER SERVICE**—Designed primarily for oil service, Logan Hydraulic Cylinders can also be used for water service if the water is treated, or the cylinders are made from special material.

**FREE ENGINEERING ADVICE**—Ask for recommendations on hydraulic cylinders and circuits. No obligation.

## NEW CATALOGS

Write for your copy of this new free catalog on Logan ROTOCAST Hydraulic Cylinders.



# Logan

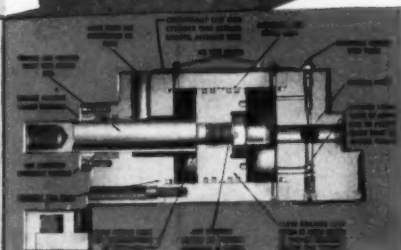
*Air and Hydraulic Equipment*

**SAVES**  
TIME  
EFFORT  
MOTION

LOGANSPORT MACHINE CO., INC.

903 PATYSON RD.  
LOGANSPORT  
INDIANA

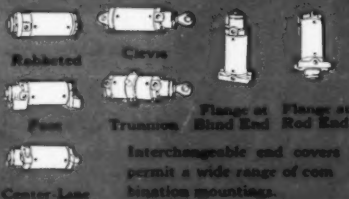
UNIVERSAL - STEEL - ROBERT - VALVES - PRESS - TURF - FLOW - COOLANT - PUMPS



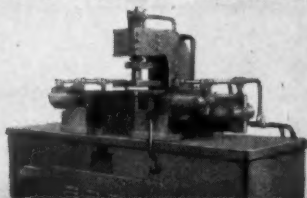
## THESE ROTOCAST FEATURES INSURE MORE EFFICIENT PERFORMANCE:

- Clean, accurate cylinder bores—honed to a mirror finish—assure smooth, full power flow
- Dimensional accuracy retained for life of cylinder by centrifugal-cast barrel
- Automotive-type piston, rings and smooth bore minimize friction and leakage
- "O" rings provide permanent, leak-proof seal between barrel and end covers
- Cushioned one or both ends if desired. Standard ratio, 2:1 differential and double-end piston rods

## 7 STANDARD MOUNTING TYPES



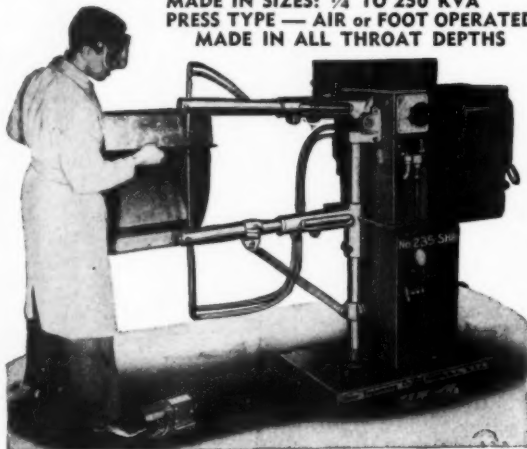
(Right) Hydraulic piercing press made with 4 ROTOCAST Cylinders to perform the piercing operation.



# SPOT BUTT ARC WELDERS

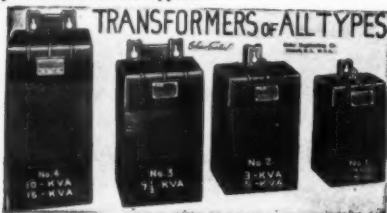
**SPOT WELDER TIPS, HOLDER & HORNS**  
**ASK FOR EISLER'S TIP & WELDER CAT**

MADE IN SIZES:  $\frac{1}{4}$  TO 250 KVA  
PRESS TYPE — AIR or FOOT OPERATED  
MADE IN ALL THROAT DEPTHS



**WE MAKE ALL TYPES OF TRANSFORMERS**  
SIZES FROM  $\frac{1}{4}$  TO 250 KVA OIL COOLED TYPE

TYPES: Furnace, Distribution, Lighting, Power, Auto, Phase Changing, Air, Oil or Water Cooled, Reactors and Special Transformers of all types.



**CHAS. EISLER**  
**EISLER ENGINEERING COMPANY, INC.**

762 South 13th Street (near Avon Avenue)  
NEWARK, NEW JERSEY, U. S. A.



*Arc Welders*  
100 TO 400 AMPS.



*Butt Welders*



FOOT  
AIR  
MOTOR  
OPERATED

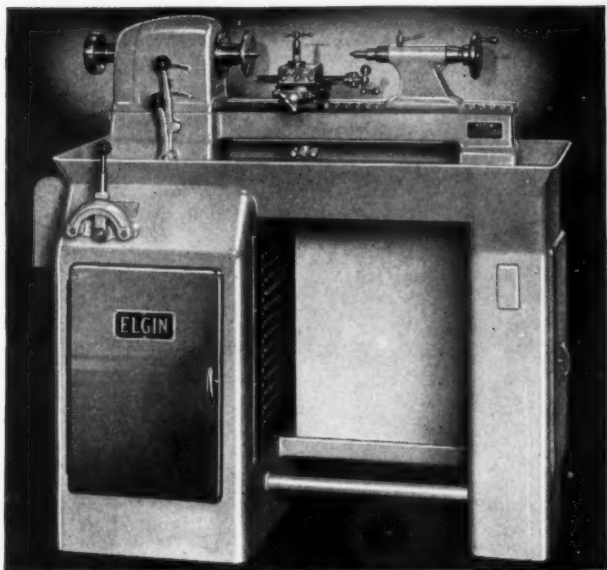
*Spot Welders*



PRESS  
TYPE

*Spot Welders*

FOOT, AIR  
OR MOTOR OPERATED



## ELGIN Now Provides Operator Comfort

- The "Elgin Line" now is furnished with knee-hole bases with foot rests, permitting operator to sit comfortably, close-up and directly in front of work.
- Motor is mounted in base with direct cross ventilation.
- Three shelves are provided on right hand side.
- Collet board is on left hand door, below the convenient centralized controls.
- Variable speed drive provides stepless spindle speeds from 40 to 4000 rpm.

*Write for full details.*

# ELGIN TOOL WORKS

1772 BERTEAU AT RAVENSWOOD AVE. — CHICAGO, ILL.

**AMERICAN  
LASOSAL**

## **DRILL JIG BUSHINGS**



**QUALITY  
SERVICE**

## **IMMEDIATE DELIVERY**

Complete stocks maintained at all times by exclusive distributors throughout the U.S. and Canada.

Precision made from finest oil hardened tool steel—ASA Standard—with concentric ground lead to insure perfect alignment.

**FREE DELIVERY ANYWHERE IN THE U.S.A. OR CANADA**

The **STANDARD** of COMPARISON ★ for **QUALITY** and **ACCURACY**

**SEND FOR NEW CATALOG and NAME OF NEAREST DISTRIBUTOR**

*American Drill Bushing*  
**CO., INC.**

1110 So. Santa Fe Avenue, Los Angeles 21, Calif.

**SPECIALIZING ONLY IN DRILL BUSHINGS**



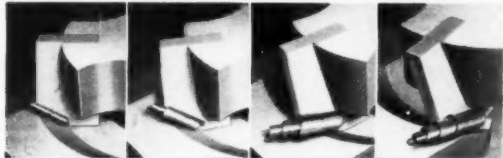
# INGERSOLL BUILDS

# World's Largest MILLING CUTTER



• We hope you saw this 91" diameter 9 ton Ingersoll Shear Clear Face Mill in Chicago at the Machine Tool Show because it is indicative of Ingersoll's wide range of experience designing and building inserted blade milling and boring tools. Ingersoll makes tools that vary from the size of your thumbnail to the mammoth Shear Clear Face Mill pictured.

• The engineering skill exhibited in this large cutter is also available to you. We ask for the opportunity to discuss the application of Ingersoll inserted blade tools to your milling and boring operations. Cutters are available with High Speed Steel, Cast Alloy, or Carbide Tipped blades to suit your particular conditions.



• Illustration above shows chip formation with Ingersoll patented Shear Clear Face Mill. Available with High Speed Steel, Cast Alloy, or Carbide Tipped blades, and with angles suitable for cast iron, steel, or aluminum. Did you see the Carbide Tipped Shear Clear milling die block steel at Ingersoll booth in Chicago?



Write for Catalog 56(E)  
giving the complete details  
of Ingersoll Inserted Blade  
milling and boring tools.

THE INGERSOLL MILLING MACHINE CO., NEWFARM, ILLINOIS

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

**HANDS** *Work Faster*  
**WHEN** *EYES See Better!*

# LOCALITES

## Cut Production Costs

In thousands of industrial plants, Fostoria adjustable localized lighting units are spotting high level illumination exactly where needed. Localites pay off in greater worker efficiency wherever the task requires good seeing.



**MODEL**  
**3267-C-172**

Used for machine tools, assembly inspection, repair work. Overall length 32 3/4". Three open-type joints. Circular mounting base. Over 150 footcandles illumination.

**\$5.89 COMPLETE**  
 (Net Industrial Price)



**MODEL 10-F-512**

Used for large presses, etc. Overall length 27 1/4". Two permatension joints. Base fits outlet box. Over 200 footcandles illumination.

**\$7.16 COMPLETE**  
 (Net Industrial Price)



**MODEL 3267-H-174**

Popular on many types and kinds of machine tools. Overall length 32 3/4". Three open-type joints. Flat oblong mounting base. Over 175 footcandles illumination.

**\$5.21 COMPLETE**  
 (Net Industrial Price)



**MODEL 3470-P-172**

Used for milling and boring machines, etc. Overall length 45 1/2". Three open-type joints. Circular mounting base. Over 200 footcandles illumination.

**\$6.11 COMPLETE**  
 (Net Industrial Price)



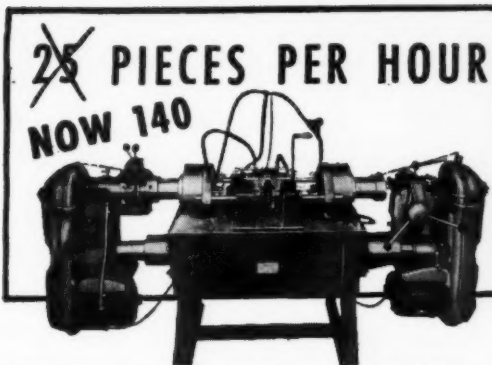
### BUY LOCALITES FROM YOUR WHOLESALE

Write for literature on Balanced Lighting and complete selection of Localite models.

### THE FOSTORIA PRESSED STEEL CORP.

FOSTORIA, OHIO

In Canada  
 Amalgamated Electric Corp. and all Northern  
 Electric Branches



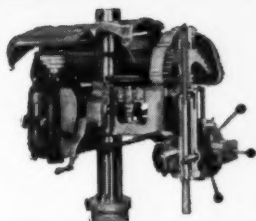
This set-up with Walker-Turner 20" automatic feed Drill Heads drills nine holes from two sides, in one automatic push-button cycle.

The Du-Fold Mop Manufacturing Company of Cleveland recently increased the production of metal mop heads by nearly 500% by using two Walker-Turner Drill Presses in a special set-up with Zagar gearless drill heads.

One head drills five and the other four holes—at opposite ends. The work locates automatically. A push button starts the complete cycle including retraction of heads.

20"  
POWER FEED  
WALKER-TURNER

Drill  
Heads



20" Power Feed Drill Press Head.  
Five standard spindle speeds,  
400 to 2600 r.p.m. with 1740  
r.p.m. motor. Capacity 1" in cast  
iron, 3/4" steel.

\*Price less motor \$216.00

### "VERY DIFFICULT PROBLEM SOLVED," says DuFold

"It has really solved a very difficult drilling problem for us and we will be placing another order shortly," is the comment on this Walker-Turner job.

We used your 20" power feed drill presses in the manufacture of 40 mm. tracer shots during the war and we were so well satisfied with them that we did not consider any other make.

The wide range of speeds, and the 10 spline spindle with no play and low investment cost are other reasons why Walker-Turner drill presses were chosen for this set up.

TWENTY-FIFTH YEAR  
1922 1947



\*F.O.B. Plainfield—slightly higher west of the Rockies and in Canada  
SOLD ONLY BY AUTHORIZED INDUSTRIAL MACHINERY DISTRIBUTORS

165

# MACHINE TOOLS

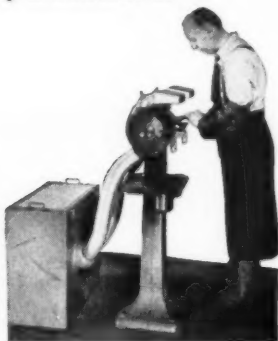
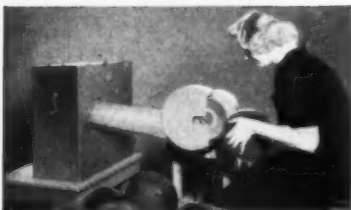
DRILL PRESSES—HAND AND POWER FEED • RADIAL DRILLS • RADIAL SAWS  
METAL-CUTTING BAND SAWS • POLISHING LATHES • FLEXIBLE SHAFT MACHINES  
RADIAL CUT OFF MACHINES FOR METAL • MOTORS • BELT & DISC SURFACERS

# STOP DUSTS



## *With Low Cost Individual* **DUSTKOPS**

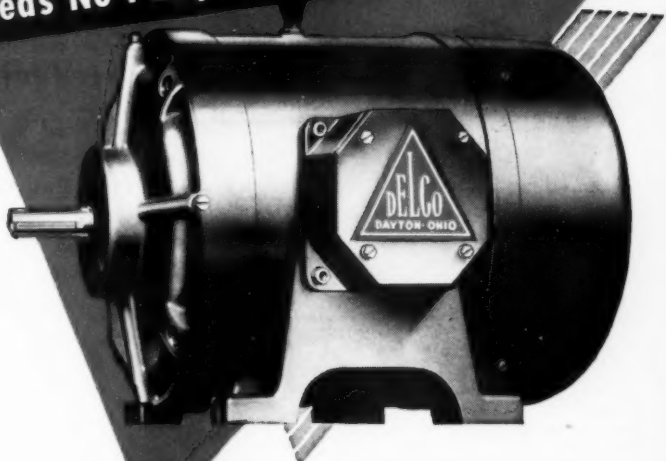
All types of dusts are stopped by Dustkops: Dusts from Grinders, Polishers, Buffers, Sanders (belt and disc), Abrasive Cut-offs; Woodworking Equipment; Fumes from Degreasers; Vapor from Screw Machines and Thread Grinders all can be stopped with least cost by DUSTKOPS.



*Send for 16-page catalog  
and recommendations for  
your dust problem.*

**AGET-DETROIT COMPANY**  
205 Main at Washington  
ANN ARBOR, MICHIGAN

**This Rugged Performer  
Needs No Pampering!**



**FEATURES THAT MEAN  
BETTER PERFORMANCE  
FOR THE  
NEW DELCO MOTOR**

Totally enclosed, fan-cooled.

Individually taped coils.

Thoroughly insulated windings.

Unit-cast, ball-bearing rotor, dynamically balanced; parts interchangeable end to end.

Double-shell frame with new simplified cooling system.

Extra-large, watertight conduit box, usable in four 90-degree positions.

Extended, accessible mounting feet, cast as a unit with main frame.

From 1 1/2-h.p. through 50-h.p.; NEMA frame sizes, 224 through 505.

## ***The New Delco Motor***

The double-shell frame is totally enclosed. The conduit box is oil- and water-tight. Greater simplicity and accessibility, better ventilation and insulation are achieved through new design practices and improved materials.

It's such advanced features as these that keep the great Delco motor performing faultlessly in spite of airborne dirt, dust, sand and scale . . . and that make maintenance procedures so few and so easily performed.

If you want to reduce motor failures and maintenance costs wherever operating conditions are unfavorable, you want to know more about the new Delco motor. Write for complete data.

**DELCO**

DIVISION OF GENERAL

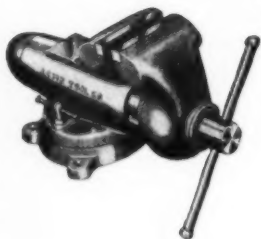


**MOTORS**

MOTORS CORPORATION

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

# Superior Holding Power with ACME VISES



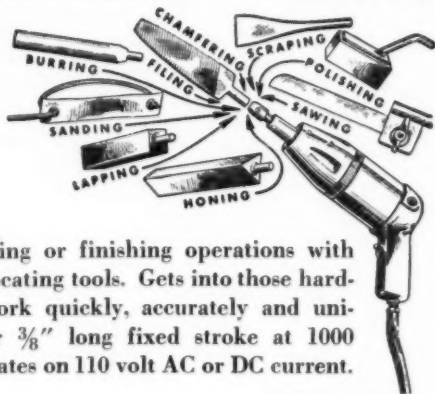
Acme Vises have all the essential features that will rigidly hold your work to the bench.

- Accurately Fitted Spindle
- Unbreakable Sleeve Nut
- Even, Central Pull
- No Side Twist
- Interchangeable Jaws

*Made in 11 sizes from 2" to 6".*

## RECIPROCATING TOOLS PORTABLE ELECTRIC

In and Out Action  
Uniform Stroke  
Uniform Work  
Unusual Accuracy



Speed up your hand filing or finishing operations with these light weight reciprocating tools. Gets into those hard-to-reach places. Does work quickly, accurately and uniformly. Delivers  $\frac{1}{8}$ " or  $\frac{3}{8}$ " long fixed stroke at 1000 strokes per minute—operates on 110 volt AC or DC current.

Write for Literature

Prompt Delivery



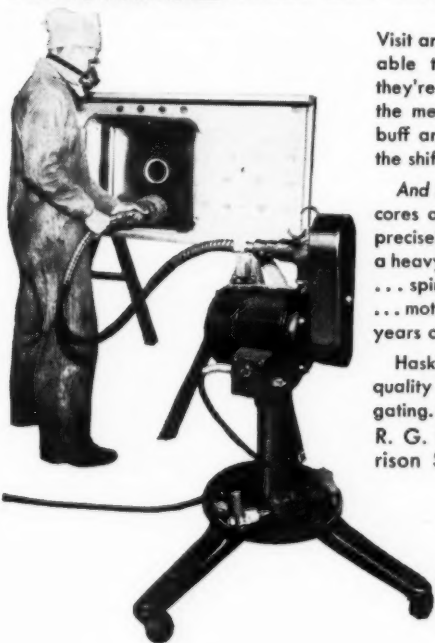
# ACME TOOL COMPANY

71 W. BROADWAY

NEW YORK 7, N. Y.



**FIRST to Go . . . . LAST to Stop!**  
***haskins*** tools are useful 'round the clock!



Visit any fabricating plant where Haskins portable tools are used—and watch the uses they're turned to! In every stage of fabrication, the men use the Haskins to grind, file, sand, buff and polish—it keeps working throughout the shift.

And it's built to do just that! Flexible shaft cores are of Swedish high carbon music wire, precisely wound and used in combination with a heavy-duty, reinforced, rubber-bound casing . . . spindles are built with tool-room accuracy . . . motors give constant flow of power through years of steady service.

Haskins flexible shaft machines offer you a quality and usefulness that are worth investigating. Do that—now! Ask for Catalog No. 45. R. G. Haskins Company, 2645 W. Harrison Street, Chicago 12, Illinois.

**HS-4:** widely used in fabrication of all steels; 1/2 h.p. multi-speed, countershaft unit, 1500 to 7800 R.P.M., mounted bench height on caster base, 360° swivel. One of many models.



***haskins***

**FLEXIBLE SHAFT EQUIPMENT**

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

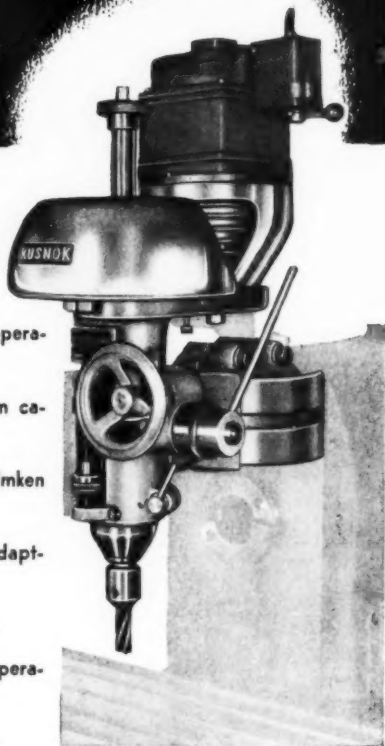
MEMO

Tom— I think the  
RUSNOK has every  
feature we need  
for our milling  
requirements.  
Let's write for  
their free illustrated  
circular. J.D.P.

- Precision built for the heavier duty operations
- Heavy duty— easily handles maximum capacity— $1/16"$ — $3/4"$  end mills
- Six speeds—six splined pulley drive—timken tapered roller bearings
- Brackets to fit most milling machines—adaptable to many other types of machines
- Utilizes an unlimited variety of cutters
- For vertical, horizontal and angular operations
- 4" quill travel—#9 B & S spindle taper

**Write for illustrated circular**

**prompt delivery**



HEAVY DUTY

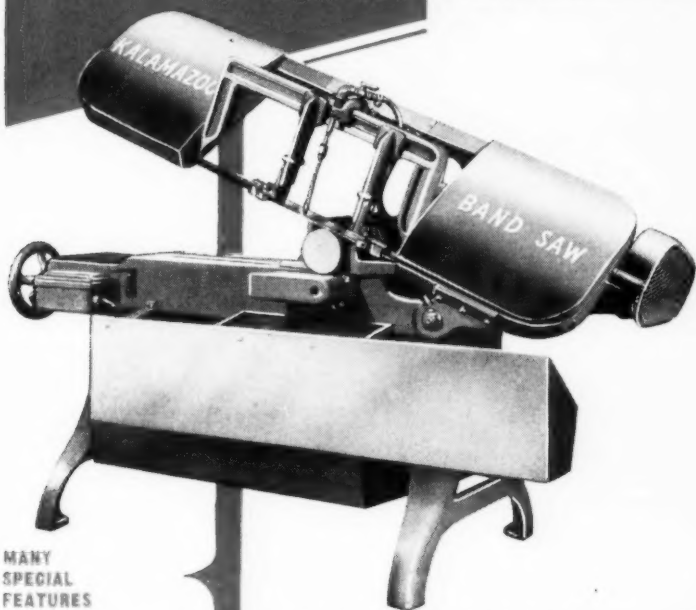
**RUSNOK**

ATTACHMENT

**MILLING • DRILLING • BORING**

RUSNOK TOOL WORKS • 4840 W. NORTH AVENUE • CHICAGO 39, ILL.

# KALAMAZOO



## MANY SPECIAL FEATURES

- Cuts tubes, rods, angles, heavy or flat stock.
- 8" x 16" throat handles 95% of all cut-off work.
- Entirely enclosed saw frame for safety.
- Blades mount from top for easy servicing.
- Cutting action always visible from above.
- Interchangeable motor mount takes any motor in emergency.
- Off-the-floor built-in coolant.
- Portable—for plug-in operation anywhere.

**A PRODUCT OF . . . . .**

## KALAMAZOO METAL CUTTING BAND SAW

**BIG SAVINGS** in cutting off metal to lengths. Extremely fast because of continuous cutting action—automatic operation and quick set-up. Cuts with precision accuracy.

Wet Model suitable for production cutting at highest speeds. Dry Model for occasional cutting. Requires only a small investment to **MODERNIZE YOUR METAL CUTTING.**

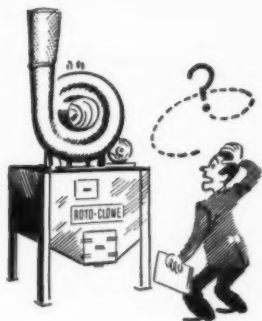
## MACHINE TOOL DIVISION

**Kalamazoo Tank & Silo Co.**

**Kalamazoo 14, Michigan**

# *To buyers of* **WAR SURPLUS ROTO-CLONES**

*we offer our  
cooperation*



Our equipment serves you best when applied the right way to the right job. Make sure you have the proper unit for dust control service in your particular operation.

SEE YOUR LOCAL  
AAF REPRESENTATIVE  
FOR THIS FREE SERVICE

- ★ Proper Application of Roto-Clone to Your Job
- ★ Proper Installation
- ★ Operating Instructions
- ★ Maintenance Instructions

**AAF**

**ROTO-CLONE**  
**DUST CONTROL EQUIPMENT**

MUCH of the Roto-Clone equipment, now being offered as Government War Surplus, was built for a single and specific wartime purpose rather than a peacetime production job. Then, too, dust control equipment must conform to existing State, Federal, and Industrial Codes.

We're interested in seeing that every Roto-Clone user is a satisfied and enthusiastic owner of our equipment. Experience has proved this to be a sound policy as evidenced by the fact that one Roto-Clone installation, properly applied and installed, results in an average of 9 future sales.

To insure maximum service benefits, American Air Filter offers its experience and facilities to buyers of war surplus Roto-Clones. You can always depend on American Air Filter to offer you the finest of service and find the answer to problems of dust control. Please call upon us.

**American Air Filter Company, Inc.**  
312 Central Avenue, Louisville 8, Ky.

Look to MODERN for accurate  
fast, economical thread cutting

Hardened and ground throughout

Wider threading range

Made with least  
number of parts

Cut close-to-shoulder threads  
without special chasers

Easily adjusted for thread size

Greater flexibility

Quick and easy chaser change



# MODERN

STATIONARY TYPE SELF-OPENING

# DIE HEADS

Modern Precision Tools  
Include . . . . .

- STATIONARY SELF-OPENING  
DIE HEADS
- ROTARY SELF-OPENING  
DIE HEADS
- STATIONARY  
COLLAPSIBLE TAPS
- ROTARY  
COLLAPSIBLE TAPS
- MODERN-MAGIC  
CHUCKS AND COLLETS
- SELF-OPENING  
STUD SETTERS
- INSERTED BLADE  
FACE MILLING CUTTERS
- SOLID ADJUSTABLE  
DIE HEADS
- ADJUSTABLE HOLLOW  
MILLING TOOLS
- UNIVERSAL CHASER  
GRINDING FIXTURES

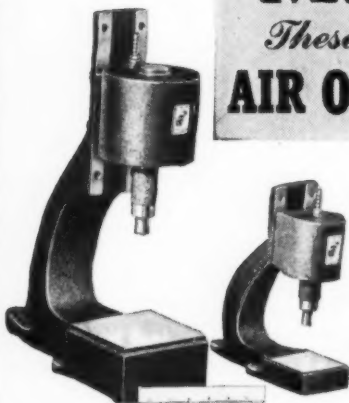
Modern Self-Opening Die Heads thread diameters from  $\frac{1}{8}$ " to 7" in standard heads, and up to 14" in special heads . . . accurately, fast, and economically. They are adapted to practically every thread cutting operation within their capacity. Designed for use in hand screw machines, turret lathes, and other machines where the die heads are used in a stationary position.

For complete information  
write for Bulletin No. M-1

## MODERN TOOL WORKS

DIVISION OF  
CONSOLIDATED MACHINE TOOL CORPORATION  
ROCHESTER 10, NEW YORK

# MEAD *Presents* These New Money-Saving AIR OPERATED DEVICES

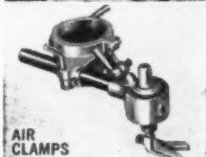


## AIR PRESSES

Two more useful new Mead devices for many operations. Power factor, four times line pressure. Handles many staking, crimping and similar operations. Dies and similar tools may be added.



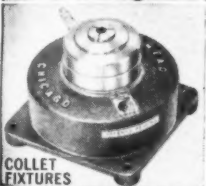
FLAT TOP  
WORKHOLDER



AIR  
CLAMPS



PNEUMATIC  
WORK FEEDERS



COLLET  
FIXTURES



MIDGET  
AIR CLAMPS

## USE MEAD AIR POWER

Get faster, more economical production set-ups—investigate the entire "family" of Mead Air-Operated devices. Hundreds of progressive factories now use them to do better, faster, more economical jobs. Do you want to move things—lift them, slide them, tilt them—or hold them firmly? Mead Air Power will do it. Do you need a delicate, flexible touch—or tremendous pressure? Mead Air Power has them both. If you are interested in saving time, money and man-power now and for the future, investigate Mead Air-Operated devices now.

## CATALOG READY

Send for copy of our new Air Power Catalog illustrating, describing many new man-and-money-saving devices.



**MEAD**  
SPECIALTIES COMPANY

4114 N. KNOX AVE., DEPT. YA-127, CHICAGO 41, ILL.



## **1/3 MORE OUTPUT PER DAY**

**T**HIS large midwest gray iron foundry had a number of automotive jobs where the cleaning of recesses required an extension grinder. Their grinders were air type, operating at 7200 RPM. It was a bottleneck; so they called in the Rotor Application Engineer to find a better way.

They had 180 cycle current available so the Rotor man recommended a high cycle grinder with a 27" extension, 10,800 RPM speed and 2" cone wheel. Results:

*33 1/3% more castings per day because of stepped up RPM and because the high cycle grinder maintains its speed under load.*

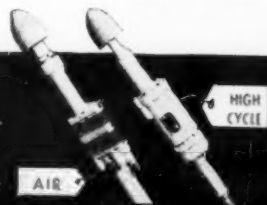
High cycle grinder has capacity to absorb temporary overload and does not lose power with age.

The Rotor man will be glad to make a similar study in your plant to see if there are ways to cut costs.

**HI-CYCLE O'TOOL**

THE **ROTOR TOOL** CO.  
CLEVELAND, OHIO

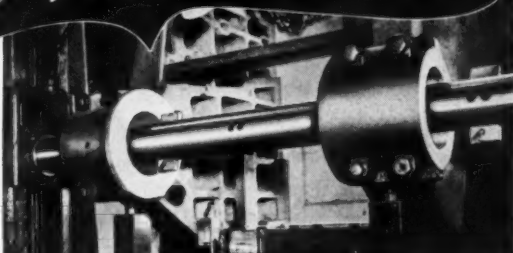
UNBIASED ANALYSIS OF UNUSABLE TOOL PROBLEMS



# DAVIS LINE BARS WITH BLOCK TYPE CUTTERS BORE HOLES

## *Faster and Better*

This Davis Line Bar bores two bearings simultaneously. Interchangeable block type cutters simplify the boring operation and cut overall time.



### **Cutter Blocks Set to Size in Tool Room Are Quickly Locked in Bar...This Precision Setting Ends "Cut and Try" Methods**

It is now possible to save up to 50% in line boring time by using Davis Line Bars and block type cutters. This valuable saving is made through the elimination of trial cuts and repeated cutter settings to obtain bore size. Davis block cutters are ground to size in the tool room and are merely inserted in the bar slot by the machine operator and positively locked with a single taper lock screw. This method of handling quickly assures the same cutter setting previously established in the tool room.

### **There Is a Davis Line Boring Bar For Your Individual Need**

Davis produces a wide range of plain and block type line bars designed to meet both general and specific boring needs. Soft bars may be had for limited production, heat treated boring bars for heavy duty service and carburized and hardened bars for high production work. Any of these line boring bars may be slotted to take one or more single or multiple cutter blocks, micrometer adjustable blocks and super micrometer adjustable fly cutters or any combination of these required.

Inquire now of experienced Davis Engineers how these line boring bars and block type cutters will increase production as well as profits.



**DAVIS BORING TOOL DIVISION OF**  
Giddings & Lewis Machine Tool Company  
144 Doty Street, Fond du Lac, Wisconsin

# 4 TONS of PRODUCTION

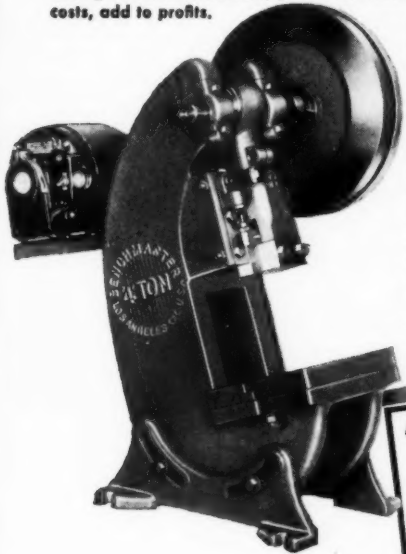
## BENCHMASTER for every conceivable punch press application

Benchmaster is a small press doing man-size jobs. It does them more economically for two reasons: Exceptionally high speed of 285 strokes per minute and low initial cost. By lifting daily output and reducing machine investment, you lower manufacturing costs, add to profits.



## BENCHMASTER has BIG punch press features

There's no cut in Benchmaster quality despite low initial cost. Sturdy, open-back inclinable frame is semi-steel for maximum resistance to deflection — accurate die alignment is maintained, die life lengthened. Bronze bushings support crankshaft and easy replacement multiplies useful life; Ram height is adjustable with  $5\frac{3}{4}$ " die space to bolster plate, ram up; Clutch has positive, single trip action, or ram travel will repeat with each fly-wheel revolution. Brake and automatic knockout included; Large, rigid 6" x 8" bolster plate equipped with 2" center hole. 1" or  $1\frac{1}{4}$ " strokes standard,  $1\frac{1}{2}$ " and 2" strokes to order.



Write Dept. MT for free circular.

### AUTOMATIC FEED with new BENCHMASTER FRICTION ROLL FEED!

Fits all Benchmasters and is adaptable to most other presses. Eliminates hand feed, adds to operator safety, speeds operations. Instantly adjustable for die height.  
STOCK CAPACITY: 3" wide x  $3\frac{1}{16}$ " thick.  
ADJUSTABLE FEED: 0" to 3" per ram cycle.  
Mounts for either front or side feed.



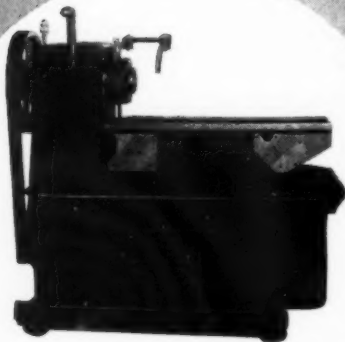
# benchmaster

MANUFACTURING COMPANY  
2952 WEST PICO BOULEVARD  
LOS ANGELES 6, CALIFORNIA



WORLD'S LARGEST PRODUCER OF SMALL PUNCH PRESSES

# NOW! *A Tailor-Made* PRODUCTION LATHE



## SAVE MONEY ON A LATHE EXACTLY SUITED TO YOUR WORK WITH THE "BASIC UNIT + PARTS" PLAN

Your starting point is the "Basic Unit" of the heavy duty Minneapolis Production Lathe. To it you can add exactly the accessories needed for your specific production job,—any drive, any collet, mandril or chuck, or any cross-slide, carriage or turret. By ordering only as many accessories as you need—you have a Lathe "tailor-made" for your present work at a minimum investment. Additional equipment can be added as needed, including specially designed jigs or attachments as desired.

WHAT IS YOUR PRODUCTION PROBLEM? Write us, send sample part or drawing—we'll be glad to quote you on a Minneapolis Lathe "tailor-made" for your work.

### CENTRAL MACHINE WORKS CO

*Machinery Designers and Manufacturers Since 1890*

1260 Central Ave. N. E., Minneapolis 13, Minn.

#### ANY DRIVE

Single Speed  
Slow Speed Chain  
Four Speed  
All-Electric Multi-Speed

#### ANY COLLET

Plain Collet  
Serrated Collet  
Collet with Pads  
Overhanging Collet  
Expanding Mandril

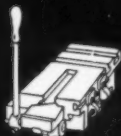
Manual or Air Operation  
of Collet or Mandril

Any CHUCK, air or hand  
operated

#### ANY ACCESSORY



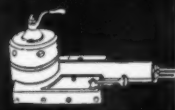
CROSS-SLIDE: Hand  
Screw feed



CROSS-SLIDE: Rock and  
pinion feed



CARRIAGE: With manual  
or power feed, 3 lengths  
to 18"



TURRET: 4 station flat  
type, with hand or power  
feed

# You Can TELL It's a Threadwell



— by its **COLD-TEMPER** performance —  
treated at 120° below zero to give it the  
hardness that means more threads per tap

— by its *i-dot-ification*—red dot for cut thread,  
white dot for commercial ground, blue dot  
for precision ground

— by its *polished flutes* for extra protection  
against chip clogging and breakage

— by its greaseless rust-proofing that keeps  
it clean, dry and shining—never messy and  
sticky

— by its *tap-capsule* that provides individual  
tap protection and makes it easy to select  
the right tap before unwrapping

— by the *personal attention* service your tap  
orders, large or small, get at the factory and  
at your local Threadwell distributor's.

See for yourself what these Threadwell extras  
mean to you in terms of better, easier, lower cost  
thread production. Just ask for Threadwell —  
they cost no more.

*Delivery on standard items  
now being made from stock*

SOLD EXCLUSIVELY BY MILL SUPPLY DISTRIBUTORS  
THROUGHOUT THE UNITED STATES AND THE WORLD

## THREADWELL

TAP AND DIE COMPANY

GREENFIELD, MASSACHUSETTS, U. S. A.  
CALIFORNIA OFFICE, THREADWELL TAP & DIE CO. OF CALIF., 1327 SANTA FE AVE., LOS ANGELES 21

*Threadwell*  
"TAPS OF DISTINCTION"

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

Burdened down with  
"loaded" wheels?



## **.. use a ROBERTSON COOL-CUT**

MANY GRINDING WHEELS lose their effectiveness when they become "loaded," or filled in with bits of metal. A Robertson Cool-Cut Wheel, with its revolutionary open structure and its "clawing" action, uses only a few cutting grains at one time. The spaces in between are available for chip clearance. That is why a Robertson resists loading more than a conventional wheel. The results: cool cutting, even on the hardest metals—accurate, fast production—and lowered grinding-costs.

Hard to believe? Then take the experience of this manufacturing plant in Philadelphia: Grinding rivets from drop forgings on a centerless grinder, they were getting only 25 rivets per wheel-dressing, taking off  $\frac{1}{16}$ " stock on a plunge cut. When a Robertson SA 54-QV wheel was substituted on the same job, production was increased to 125 rivets per wheel-dressing . . . an increase of 400%!

This is typical of the results reported by users of Robertson Cool-Cut Wheels. Whether you are doing surface grinding, internal grinding or cylindrical grinding . . . whether the material you are working is steel, cast-iron or bronze . . . you'll find that a Robertson Cool-Cut Wheel will substantially increase your production and at the same time lower your grinding costs.

### **ROBERTSON MANUFACTURING COMPANY TRENTON 5, NEW JERSEY**

**Manufacturers of Vitrified-Bonded Grinding Wheels • Mounted Wheels • Segments**

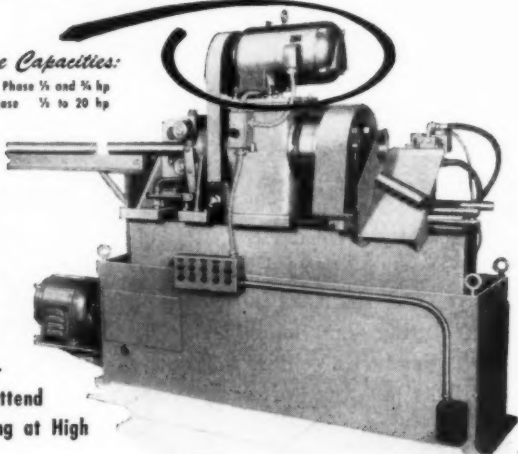
# PROVEN *Performance* PAVES *the* WAY

for  
**PINES ENGINEERING COMPANY, INC.**  
**AURORA, ILLINOIS**

### *Drive Capacities:*

Single Phase  $\frac{1}{2}$  and  $\frac{3}{4}$  hp  
Polyphase  $\frac{1}{2}$  to 20 hp

The new PINES Full Automatic Rotary Cut-Off Machine, developed to complete the line of PINES tube working equipment is truly automatic. Hydraulically operated and with power driven conveyor, one operator can attend several machines operating at High Production Speeds.



To maintain proper cutting speeds for tubes from  $\frac{1}{2}$ " O.D. to  $2\frac{3}{4}$ " O.D., PINES chose LIMA multi-speed Gearshift Drives to be used as an integral part of this new machine to control cut-off operations.

If you manufacture machinery requiring selective speeds, let us tell you how LIMA multi-speed Gearshift Drives can be integrally adapted to your product. There is no charge for consulting services. Write us today.



## THE LIMA ELECTRIC MOTOR CO.

262 FINDLAY ROAD

LIMA, OHIO

REPRESENTATION IN MOST PRINCIPAL CITIES

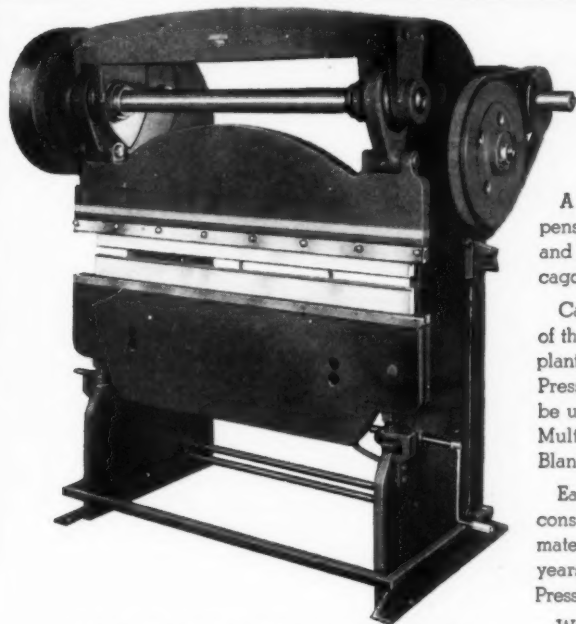
LIMA GEARSHIFT DRIVES

LIMA PEDESTAL GRINDERS — LIMA ELECTRIC MOTORS



# Powerful CHICAGO

## STEEL PRESS BRAKE



### TYPE "300"

A POWERFUL, rugged, inexpensive Press Brake, designed and built to the standards of Chicago Steel Forming Presses.

Can handle 40 to 50 percent of the work done in the average plant, thereby releasing the larger Presses for heavier work. Can be used for Forming Embossing-Multiple Punching, Notching, Blanking, etc.

Easy of operation, accurate and constructed of highest quality material and backed by over 45 years experience building Steel Press Brakes and Bending Brakes.

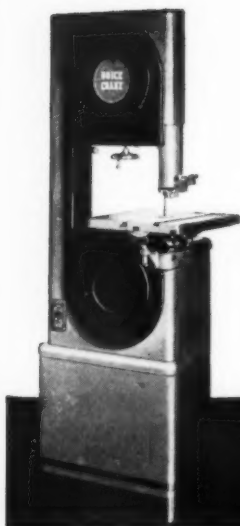
World's largest manufacturer of Steel Hand Bending, Power Bending and Power Press Brakes.

A dependable variable speed drive much desired by all users is standard.

A Small Steel Welded Construction Press Brake a brute for punishment and a prodigious worker for the Sheet Metal Plant—

—3 sizes—capacities 10 gage, 4 ft. long; 12 gage, 5 ft. long; 14 gage, 6 ft. long. Powered by 1½ h. p. motor.

**DREIS & KRUMP MANUFACTURING CO.**  
7440 LOOMIS BLVD. . . CHICAGO 36, ILLINOIS



**FOR SPEED  
AND ACCURACY**

**IN  
CUTTING PRACTICALLY  
ANY MATERIAL**

**BOICE-CRANE**  
Series No. 2300  
**14" BAND SAW**

Operates at higher speed—4,400 blade feet per minute. Smoother and faster cutting. Sturdy enough for foundries and production. Accuracy to spare for tool and die work, like contour sawed cams, dies, and punches; ideal for experimental laboratories and pattern shops.

Single and 8-speed back-gear models for cutting practically any material. Clears 8 $\frac{1}{2}$ " under the guide.

One-piece welded steel frame has tremendous strength. Wheels and blade, except at cutting point,

are entirely enclosed. Cabinet type base has sealed-off motor compartment. High safety rating.

Blade guides adjust by a single control, and with full safety, even when machine is running. Close balance and light, but strong Textolite wheels permit twice the speed of other 14" machines. Less vibration, and longer bearing life. Saws wood two to four times faster. Often pays for itself in 3 to 6 months.

**SPECIFICATIONS:**

Sawing Capacity: Blade to guard—13 $\frac{1}{2}$ ", 27" dia. work. Guide to work table—8 $\frac{1}{2}$ ".

Table: Tilts on Double Trunnions. Size 15"x15 $\frac{1}{2}$ ".

Height Overall of Floor Model: 67".

Blade Widths: 3/16", 1/4", 5/8", 1 $\frac{1}{2}$ " and 3/4".

Length of Blade: 98".

Wheels: Disc. Moulded Textolite, 14" dia. 1" face.

Bearings: Grease-sealed Ball Bearings.

**FOR A GUARANTEE OF SATISFACTORY SERVICE**

buy only from long established manufacturers who **SPECIALIZE** in producing power tools, rather than making them a sideline.

**WRITE FOR FREE LITERATURE**

**BOICE-CRANE COMPANY**

**936 Central Avenue**

**Toledo 6, Ohio**

**DRILL PRESSES • JIG SAWS • BELT SANDERS • LATHES • JOINTERS**

**SAW JOINTERS • THICKNESS PLANERS • TILTING ARBOR SAWS**

**SPINDLE SANDERS • SPINDLE SHAPERS • BAND SAWS**

✓ **LOWEST COST**  
✓ **HIGHEST QUALITY!**

**NEW  
CHIP BREAKER  
GRINDER**

by  
*Hammond*  
**OF KALAMAZOO**

Here's the answer to your chip breaker grinding problem. No longer is it necessary to tie up expensive grinding equipment or put up with slow makeshift methods to grind chip breakers. The HAMMOND Model C-4 is low cost — precision built — and especially designed for carbide chip breaker grinding. Note these features:

- Any-Angle Vise accommodates all angles
- Capacity — Box and Single-Point Tools up to 2"
- Fully Protected — Moving parts protected from grit and sludge
- Easy operating Reciprocating Table
- Heavy Machine Tool Construction

Available in bench model (\$295.00) or floor model (\$330.00). Prompt shipment. WRITE FOR CATALOG.

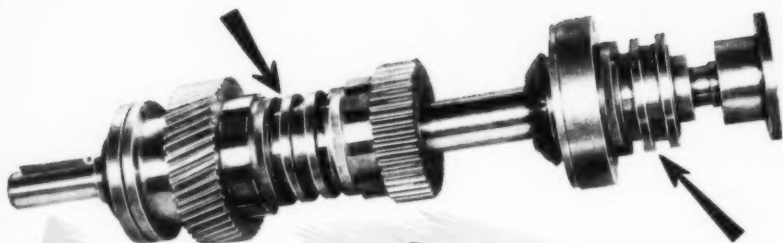


**HAMMOND Floor Type Model C-4**

*Hammond Machinery Builders*  
INC

1614 DOUGLAS AVENUE • KALAMAZOO, MICHIGAN

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK



*Single and Double*  
**MAXITORQ CLUTCHES**  
 SELECTED FOR THIS NATIONALLY KNOWN  
**MACHINE TOOL**

Pictured above is the transmission assembly of an important new machine tool, showing how two Maxitorq Clutches are installed. They were selected after comparative tests by experienced machine designers.

So that you may judge the effectiveness of the Maxitorq... and consider its use for solution of your own power transmission problems, we present these outstanding features.

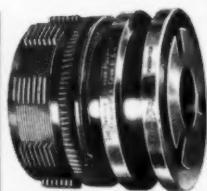
1. The Maxitorq is completely assembled on the clutch body and shipped ready to slip on a shaft.

2. NO TOOLS whatsoever are needed for assembly, adjustment or take-apart.

3. Separator Springs (patented) act, when the clutch is thrown into neutral, to separate the discs... you can see between them. Therefore there's no drag, no abrasion and no heating.

4. Disconnect is fast and positive... no slipping.

5. Clutch life is extended by means of specially finished flat, true engaging surfaces. Design is very compact, streamlined.



There are 8 sizes available, from  $\frac{1}{4}$  to 15 H.P. at 100 r.p.m., in wet or dry type, single or double. Also pulley and cut-off coupling types.

In addition to the Standard Maxitorq we are now supplying an Automatic Overload Release type especially for use in high speed machinery that processes damageable or breakable products. Disconnect is instant... and automatic... a great protection to work and machine.

Please feel free to consult our Engineers on any problem within our field of power transmission.

SEND FOR  
 NEW CATALOG NO. BB12



**THE CARLYLE JOHNSON MACHINE COMPANY**  
 MANCHESTER • CONNECTICUT

# ACRO DIE SET PULLERS



The principle of the Acro Die Set Puller is to remove the punch holder from die shoe by a straight upward pull, whereby punch holder travels upward from die shoe axially, leaving both leader pins simultaneously. This can be accomplished only by use of the indexed screw wrenches which act as indicators, controlling the upward travel. This is an exclusive patented by Acro feature, found only on Acro Die Set Pullers.



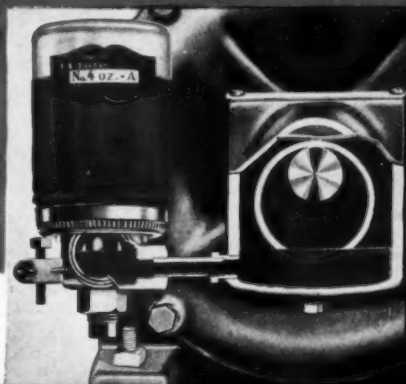
Order a set today. Convince yourself of the savings you can make in your tool room. ACRO PULLERS furnished in three sizes. Write now for more information.

**Dead visibility** — Sight glass on side of lubricator bowl an exclusive **SUPER** feature, shows exact oil level maintained in bearing plus oil supply in reservoir, eliminating guess work.

There is no drippage, no waste, no over flow. Oil is automatically led to the bearings as required.

Nationally known authorities estimate that 75 per cent of all machinery repairs are caused by inefficient and improper lubrication, and that 85 per cent of the oil bought for lubricating purposes is never used by the bearing surfaces for which it was intended. **WRITE FOR LITERATURE.**

## SUPER LUBRICATOR . . .



# ACRO

**PROMPT  
DELIVERY**

**METAL STAMPING COMPANY:** 332 E. RESERVOIR AVENUE  
MILWAUKEE 12, WISCONSIN

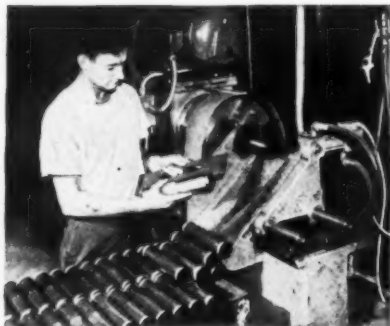
# 575

## TUBES CUT-OFF

*Per Hour*



**Pines  
Machine Cuts  
to .004" Tolerance  
in Length**

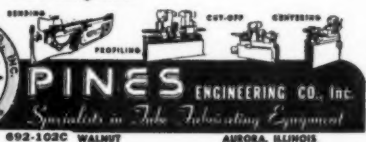


An automotive parts manufacturer uses the Pines Cut-Off machine to cut 575 pieces of tubing per hour with accuracy length to .004" tolerance. The same operation on other equipment produced only 70 pieces per hour. The Pines Cut-Off machine is the simple, automatic way to cut pipe or tubing to accurate lengths rapidly. The average time to complete the automatic machine cycle is 1½ seconds. Production of 1500 pieces per hour is possible, depending on material, diameter, wall thickness, length and type cut desired. When the machine is started by pushbutton control, it continues to cycle and cut until stock is exhausted.


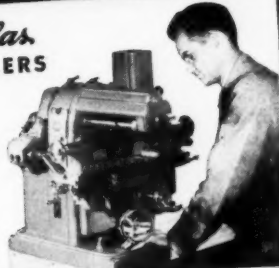

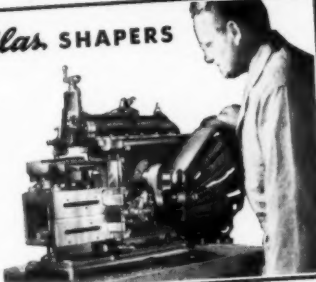
Pines Engineering Service can assist you on your tubing and pipe cut-off problems. There is no obligation.

**Today...**

write for the performance advantages of Pines Cut-Off machines. Ask for Bulletin 102C sent without cost.



# Save Hundreds of Dollars! with these LOW-COST Atlas TOOLS

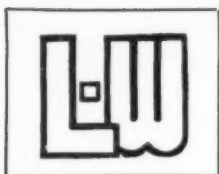
<p><i>Atlas</i> <b>"QUICK-CHANGE" 10" LATHES</b></p> 	<p><i>Atlas</i> <b>MILLERS</b></p> 
<p><i>Atlas</i> <b>DRILL PRESSES</b></p> 	<p><i>Atlas</i> <b>SHAPERS</b></p> 

Day after day . . . in plant after plant . . . Atlas tools are saving the purchase of large expensive equipment. It's simply a matter of checking machining needs against Atlas operating and production capacities . . . installing Atlas tools for *all* small parts work, reserving large machines for operations requiring large capacities. Atlas tools are precision built for close tolerance work — ruggedly engineered for smooth, dependable operation. Send for latest catalog so that you can check your own needs with Atlas specifications and capacities.

**NEW LOW PRICES**  
(F. O. B. Kalamazoo, Less motors)  
10" LATHES—\$195 to \$250  
6" LATHES—\$104.75  
MILLERS—\$285 to \$295  
7" SHAPERS—\$335  
DRILL PRESSES  
12 $\frac{3}{4}$ " \$53.50 — 15" \$65  
15" (floor) \$75

**ATLAS PRESS CO.** 1250 N. PITCHER ST.  
KALAMAZOO, MICHIGAN

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

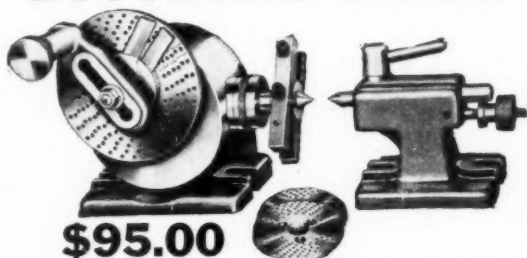


## ANNOUNCING THE NEW L-W Model SD 6-1/2" UNIVERSAL DIVIDING HEAD

Well built for hard daily usage on smaller milling machines. Rugged head and tailstock.

Alloy steel spindle has a tapered bearing. Bored for No. 9 B & S taper threaded spindle nose. Head tilts to 90° in vertical position. Special alloy steel worm and bronze worm wheel cut to close limits for accuracy. End thrust is taken out by bronze bearings.

Complete with three index plates for dividing all numbers to 50, and even numbers to 100, with the exception of 96T. Index chart shows all divisions obtainable to 380.



**\$95.00**

## L-W 11" UNIVERSAL DIVIDING HEADS

Headstock — Rugged. Rigid. Swivels to any angle.

Tailstock—Sturdy. Withstands heavy cutting.

Headstock Spindle — Tapered bearings, bored for No. 10 B & S Taper. Increased diameter and length. Threaded spindle nose. 2 1/4" diameter 10 thread USS.

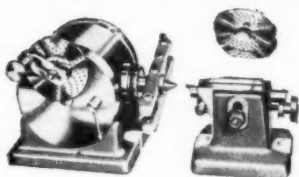
Worm — Special alloy steel, accurately finished ball bearing end thrust. Easy, accurate adjustment of worm wheel.

Worm Wheel—Large diameter, 40:1 ratio, accurately generated, securely mounted on spindle.

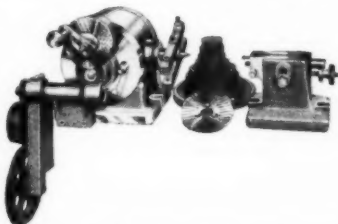
Equipment — 5/8" table slot tongues, three index plates, dividing all numbers to 50, and even numbers to 100, with the exception of 96T. Index chart shows all divisions obtainable to 380.

When ordering AU Heads specify either right or left hand model.

**Model BP for  
Plain Milling  
Machines  
\$151.20**



**Model AU Fully  
Universal for  
Complete  
Indexing and  
Spiral Cutting  
\$219.15**



Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products



RE\_MAGNETIZER



MAGNETIC GRINDER



DIVIDING HEADS



RECTIFIER



RE\_MAGNETIZING UNIT



LATHE CHUCKS



UNIVERSAL INDEXES



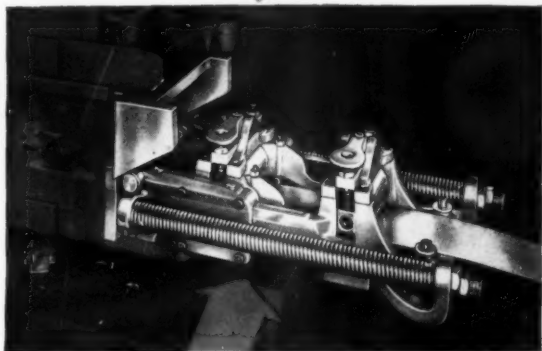
POWER HACK SAWS

# L-W CHUCK COMPANY

23 SO. ST. CLAIR ST.  
TOLEDO 4, OHIO

# Still Wasting Time

FEEDING  
PUNCH  
PRESSES  
BY  
HAND



**Increase Your Production**  
*at least 300% with*

## DICKERMAN DIE FEEDS



Here is a dependable accurate die feed that reduces operator hours 80 to 90% . . . and increases production 300% or more.

Completely automatic, it "takes over" all hand operations. It is speedy and efficient . . . tough and rugged . . . with no wearing parts to get out of order. It is flexible enough to feed stock from any angle . . . versatile enough to easily feed *any* punch press. There are advantages to be gained even on short runs of 5000 pieces.

Start saving time and increasing production at once. A Dickerman Die Feed pays for itself in a short while.

**H. E. DICKERMAN MFG. CO.**  
321-124 ALBANY STREET • SPRINGFIELD, MASS.

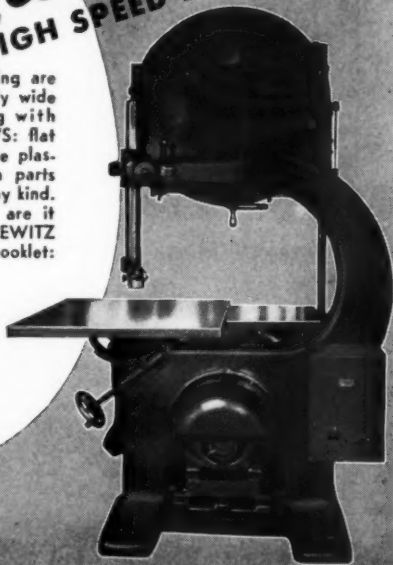
*for Sawing* METAL as HARD as a FILE  
*or Trimming* FORMED PARTS  
**- FAST!**



Actual photo of file  
friction sawn on  
Tannewitz High  
Speed Band Saw.

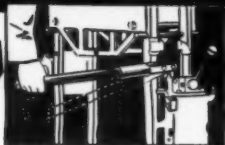
**Tannewitz**  
HIGH SPEED BAND SAWS

Cost reductions that are downright amazing are effected in the cutting of an extremely wide variety of materials by friction sawing with TANNEWITZ HIGH SPEED BAND SAWS: flat sheets, hardened or soft steels, armor plate plastics, and many others. Formed aluminum parts can be trimmed without using a rest of any kind. Whatever your cutting problem, chances are it can be done faster and better with TANNEWITZ HIGH SPEED BAND SAWS. Write for booklet: "FRICTION SAWING."



**THE TANNEWITZ WORKS**  
GRAND RAPIDS 4, MICHIGAN

# These **KRW** Hydraulic Arbor Press Features.



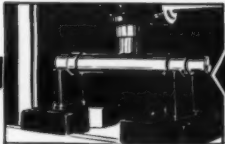
**Fast Action**, cylinder is filled as ram travels to work. You get tons of pressure with first pump stroke.



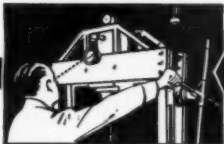
**Finger Tip Control** opens and closes valve in a jiffy. No gripping effort assures easier, faster operation.



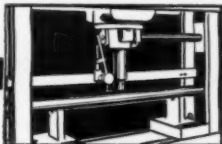
**KRW Built-in Mechanical Press** permits up to 3 tons pressure for straightening small diameter work.



**One Piece, All Steel V-Blocks** have machined surfaces for greater accuracy; usable upright or inverted.

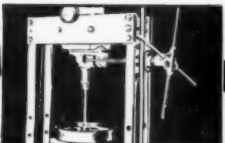


**Highly Visible Pressure Gauges** are mounted where they can be quickly checked. Read in tons and pounds.

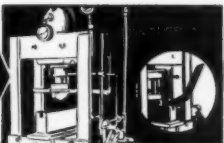


**Micrometer Dial Attachment** permits great accuracy in checking work without removing from V-block.

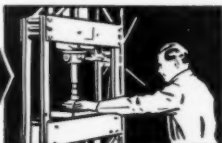
## Reduce Costs ON THESE AND OTHER DAILY *Production Jobs...*



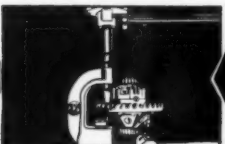
**Broaching** a key way in a flywheel. 7½ inch ram travel makes many broaching jobs practical on KRW Presses.



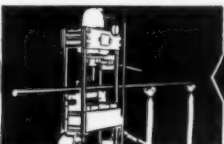
**Bending** in production lots with simple, inexpensive dies is easily done on low-cost KRW Hand-operated Presses.



**Pressing** of all types is efficiently handled. Adjustable bed makes pressing on long shafts a very simple operation.



**Riveting** with KRW Riveting Attachment is simplicity itself. Many KRW Presses are used for this type work.



**Straightening**, especially on long work, is easy on a KRW Press because of its special open-end construction.



**Blanking** is easy with simple die set for short-run operations. Releases regular equipment for quantity production.

Write for the  
**NEW  
KRW  
Catalog.....**



K. R. WILSON, 215-217 Main St., Buffalo 3, N.Y.

Please mail me a copy of your  
**Hydraulic Arbor Press Catalog**

# K·R·WILSON

215 MAIN STREET, BUFFALO 3, N. Y.

Name .....

Address .....

City..... Zone..... State..

# RACINE

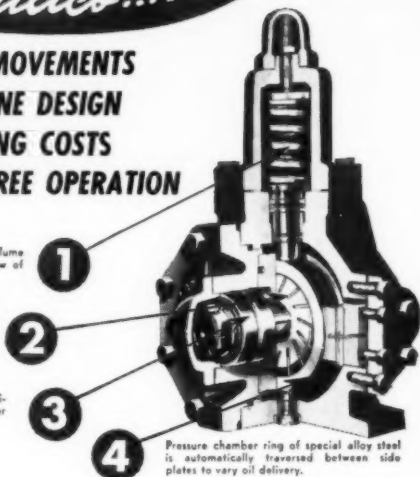
*Hydraulics... FOR*

**SMOOTH POWER MOVEMENTS  
IMPROVED MACHINE DESIGN  
REDUCED OPERATING COSTS  
QUIET, TROUBLE-FREE OPERATION**

Spring governor provides automatic volume control, supplying only the needed flow of oil at a pre-determined pressure.

Tilted vanes cannot seize or gouge the pressure chamber ring. Constant efficiency is maintained.

Heavy duty pump shaft is mounted in anti-friction bearings for long life and power saving operation.



## COMMON APPLICATIONS FOR RACINE HYDRAULIC EQUIPMENT

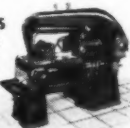
- Presses
- Machine Tools
- Wood Working Machines
- Steering Gears
- Welding Equipment
- Concrete Block Machines
- Plastic Presses
- Aircraft Equipment
- Special Machines

**R**ACINE pumps will simplify your circuits. By-pass and relief valves with the accompanying extra piping are eliminated. Since RACINE pumps by-pass no oil, heating is reduced. Horsepower is saved. Quieter operation results. These features reduce installation cost and operating expense.

Let Racine hydraulic engineers review your applications. This service is available without cost or obligation. Write today, ask for catalog P-10-C, RACINE TOOL AND MACHINE COMPANY, 1754 State Street, Racine, Wisconsin.

## RACINE Hydraulic METAL CUTTING MACHINES

A complete line in capacities 6" x 6" to 20" x 20" — in all price ranges. Features are simple. One lever control — open front design — progressive feed for cutting any metal from light tubing to tough tool steels. Write for Catalog No. 12.

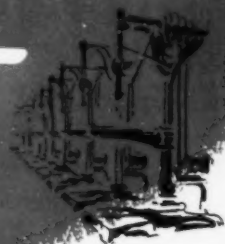


# RACINE

STANDARD FOR QUALITY AND PRECISION

# How Long -

SINCE YOU'VE  
WRITTEN OFF YOUR OLD  
DRILLING MACHINES?

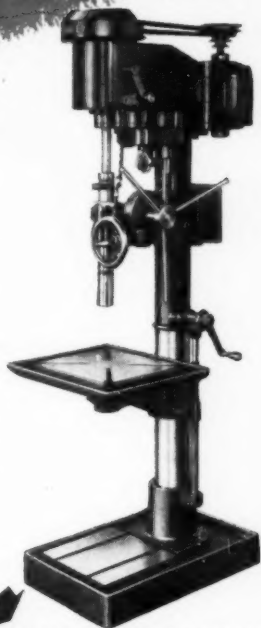


## MODEL C-20 SIBLEY 20" SWING DRILLING MACHINE

Many manufacturers are operating old drilling machines whose costs were written off years ago. Now obsolete in speed, accuracy and efficiency, they are a decided handicap in paring costs to offset higher labor rates.

Install a new Sibley and compare with your present equipment. See the advantage of easy access to controls — where you turn a knob to select the proper geared power feed; convenient shifting of V-belt; power to drill 1½" in mild steel; 8 spindle speeds from 65 to 1360 R.P.M. powered by a 2 H.P. motor.

GET COMPLETE INFORMATION ON THE  
SIBLEY MODEL C-20



# SIBLEY

MACHINE & FOUNDRY CORP.  
78 EAST TUTT STREET  
SOUTH BEND 23, INDIANA

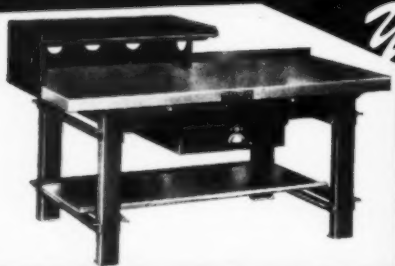
SIBLEY MACHINE & FOUNDRY CORP.  
78 E. Tutt St., South Bend 23, Indiana  
Send Catalog No. 67, Free!

NAME

ADDRESS

CITY  STATE

# PRECISION BUILT!



*Yes,* CHALLENGE  
WORK BENCHES  
*are Precision Built.*  
They are not of the  
Hammer-and-Saw Variety

Accurate work requires an *always smooth, level, unyielding* Work Bench. A Challenge Bench gives you all this.

● The rugged, two inch, cast iron top is carefully machined on top and on *all four edges* at right angles. You can depend on their accuracy.

● The top is supported on sturdy steel channel legs welded into a rigid framework by cross angles. The long channel supports are provided with lock leveling screws by which the top can be kept perfectly level at all times. The lower braces are high enough above floor to permit moving by standard lift truck.

● Tool box shelf at one corner gives added capacity as do the steel drawer and full length shelf below top. Drawer has pilfer-proof lock.

● Built in four standard sizes 28 inches wide and 48, 60, 72, and 84 inches long in three styles (1) complete as illustrated, (2) with tool box shelf and without drawer, or (3) without tool box shelf or drawer.

WRITE for Complete Catalog of Challenge Precision Equipment. Including Layout Surface Plates, Bench Plates, Lapping Plates, Straight Edges, Parallels, V-Blocks, Right Angle Irons and Angle Plates.

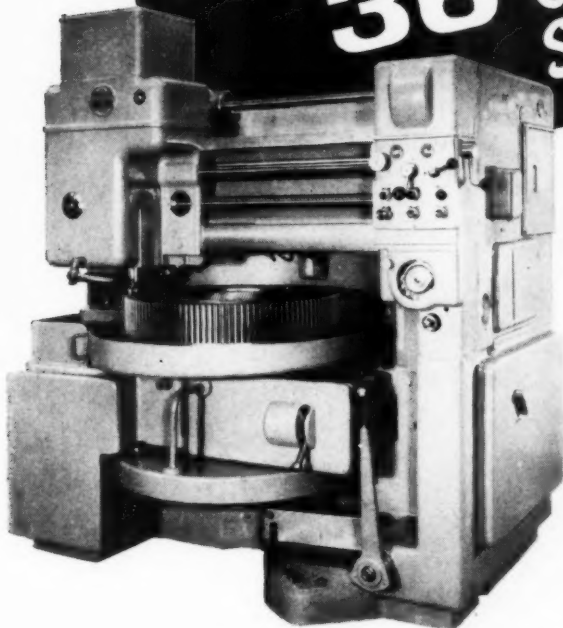
500



**THE CHALLENGE MACHINERY CO.**

GRAND HAVEN, MICHIGAN, U. S. A.

# New, "All-purpose" 36" Gear Shaper



For Spur,  
Helical and  
Herringbone,  
External and  
Internal Gears,  
Cluster Gears,  
Splines  
and other  
Profiles

This heavy-duty machine is of extremely rigid construction, permitting the taking of heavy cuts at high speed—It is easy to set up and operate.

★ Every gear shop will want complete information on this new Fellows 36" Gear Shaper.

## *Fellows*

The Fellows Gear Shaper Co., Head Office and Export Dept., Springfield, Vermont. Branch Offices: 616 Fisher Building, Detroit 2, 640 West Town Office Building, Chicago 12, 7706 Empire State Building, New York 1.

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

## DESIGN

A complete engineering service, backed by an experienced staff, is at your service to make recommendations and design special cutters.

## RANGE

Hundreds of sizes, dozens of models to meet every requirement, regardless of machines used or materials to be cut.

## SERVICE

Even special tools use standard parts which are stocked by us. There are 30 Lovejoy service centers throughout the U.S.A. — there is one near you.

## SATISFACTION

Nearly 30 years' continuous experience making milling cutters and other "Positive-Locking" tools. Our first customers are still buying our tools.

# Specials ARE OUR Specialty



The right tool for the job often means a special tool and that usually means an expensive tool. But **not** when you come to Lovejoy, because specials are our specialty—and we offer something extra special when it comes to designing and making them.

Part of that extra-special something is the fact that all our custom-made tools use a majority of **standard** parts. They are built around the famous Lovejoy positive-blade locking device and use Lovejoy interchangeable blades. This means lower initial cost, longer blade life, faster, more accurate production and simpler maintenance. The rest is made up of our nearly thirty years of experience in designing and making all types of inserted-cutter tools and a nationwide service organization that's of real value to owners of Lovejoy special tools, because Lovejoy specials have so many standard parts.

For a few examples of Lovejoy specials, see the illustrations above. They include a rugged dovetail cutter, two face mills—one 24" in diameter, the other 2½" in diameter, a special boring head, and a husky slotting cutter. All use interchangeable carbide-tipped Lovejoy blades.

If your work requires special cutters, you can make no better move than to send your problem to Lovejoy, because specials are our specialty.

**ALWAYS SPECIFY LOVEJOY**

**LOVEJOY TOOL COMPANY, INC.**  
**SPRINGFIELD, VERMONT, U. S. A.**

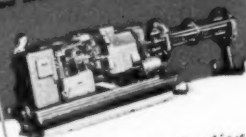
# LEARN HOW TO CUT COSTS WITH GREENLEE MACHINES

## SEE HOW AUTOMATIC TRANSFER-TYPE PROCESSING MACHINES CUT COSTS

Modern mass production requirements offer many opportunities for the use of machines of this type — on which a large number of operations can be performed, with the pieces being transferred automatically from station to station through the machine. Costs are slashed by reduction of idle time, elimination of work-handling, combination of processes, and efficient use of floor space. Greenlee has pioneered in the design and manufacture of these machines since 1934 — this booklet traces their development and illustrates outstanding examples of successful applications.

NEW DELIVERED TYPE  
LEAD-SCREW FEED  
PRECISION-THREADED

*New*  
**LEAD-SCREW FEED...**  
Now Available on Greenlee Automatics



*Speeds Production*  
**OF PRECISION-THREADED PARTS**

GREENLEE MACHINES NOW AVAILABLE WITH LEAD-SCREW FEED SYSTEM  
FOR PRECISION-THREADED PARTS

MADE IN U.S.A. BY GREENLEE BROS. & CO., ROCKFORD, ILL.

AUTOMATIC TRANSFER  
PROCESSING MACHINES  
DELIVERED TYPE

**GREENLEE**

**AUTOMATIC TRANSFER-TYPE  
PROCESSING MACHINES**

For the Centrifugal Development  
and Use of Transfer-Type Multiple  
Spindle Boring, Drilling and  
Tapping Machines

GREENLEE BROS. & CO., ROCKFORD, ILL., U.S.A.  
Special Precision Machinery

## SEE HOW LEAD-SCREW FEED ON GREENLEE AUTOMATICS CUTS COST

### ON PRECISION-THREADED PARTS

The numerous advantages of Greenlee Automatic Screw Machines are further enhanced by the advent of lead-screw feed — which produces precision work on threaded parts at screw-machine production rates. The Greenlee system is quickly adaptable to a wide range of work, insures uniform high-quality results, reduces scrap losses, increases the usefulness of the machine, and cuts costs substantially. The mechanism can be added to existing Greenlee machines.

## SEND FOR THIS LITERATURE

USE THIS COUPON

GREENLEE BROS. & CO., ROCKFORD, ILLINOIS 1842

I am interested in receiving literature as checked:

☐ Transfer-Type Machines ☐ Lead-Screw Feed for Automatics

NAME.....

FIRM.....

ADDRESS.....

CITY.....ZONE.....STATE.....

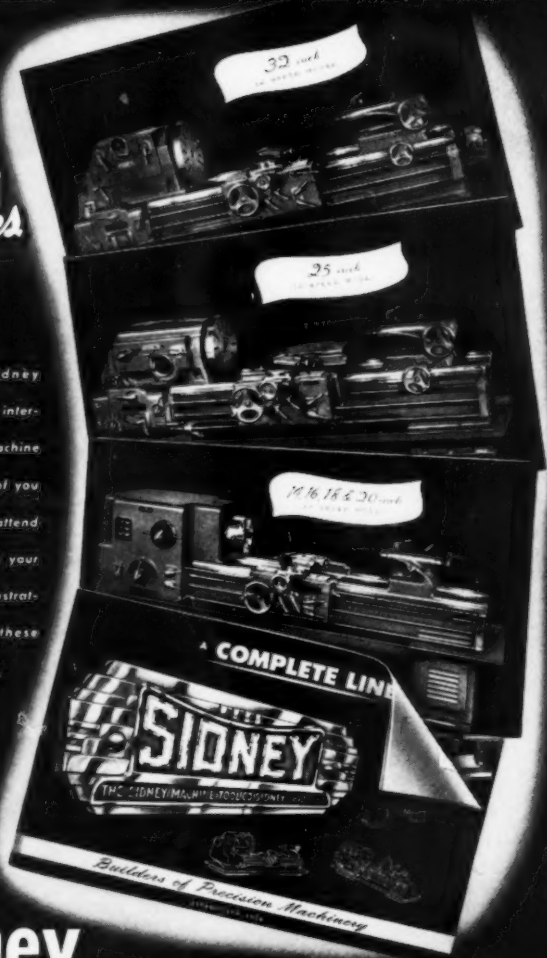


**GREENLEE BROS. & CO.**  
1842 MASON AVE.  
ROCKFORD, ILLINOIS

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

# Sidney Lathes

This new line of Sidney lathes created much interest at the recent machine tool show. For those of you who were unable to attend that exhibit, write for your copy of the bulletin illustrating and describing these outstanding machines.



# Sidney

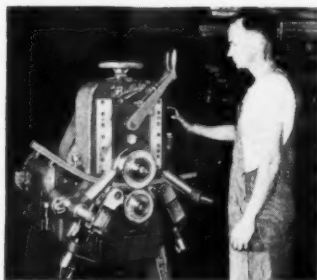
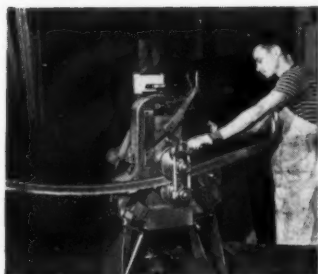
**MACHINE TOOL COMPANY**

**SIDNEY, OHIO**

*Builders of Precision Machinery Since 1904*

# Put BENDING

*on this*  
**PAYING  
BASIS**



Bending of light segments into arcs, spirals or circles **NEED NOT BE EXPENSIVE!** More and more manufacturers are discovering the **BEST** way to get bending costs down — and that is with "Buffalo" OA Bending Rolls.

With an OA, you can take angles, squares, rounds and structural shapes — and bend them accurately into scores of useful curved products — with a speed you won't believe until you have actually seen it! **DON'T LET BENDING PUT A "CRIMP" INTO YOUR PRODUCTION** — investigate what "Buffalo" can do for you — write now for all data on "Buffalo" Benders!

**BUFFALO FORGE COMPANY**  
161 Mortimer St. Buffalo, N. Y.  
Canadian Blower & Forge Co., Ltd.  
Kitchener, Ontario

*"Buffalo"*  
**BENDING  
ROLLS**



## HOFFMAN Flotation Equipment Clarifies Coolants Automatically



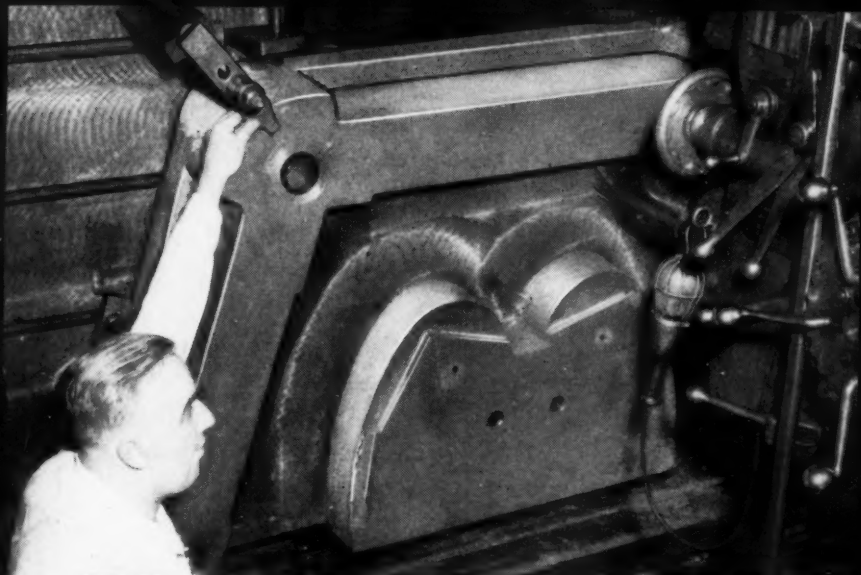
For increased machine tool productivity—longer wheel life and reduced maintenance, investigate Hoffman Flotation Equipment. No filter aids to add or change—no screens to plug—no need for constant maintenance. Dirty coolant enters a tank and is aerated by a rotor-stator. Waste solids are held in suspension by froth and skimmed off automatically. Clean coolant, of exceptional clarity, is continuously spilled into a reservoir for return to machine tools. Standard sizes with flow from 20 to 1,000 gallons per minute. Larger sizes available. Write today.

**Get Full Details and a FREE SURVEY**

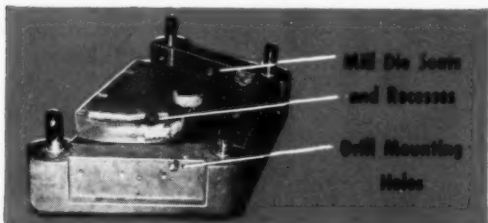
**U. S. HOFFMAN**

**MACHINERY  
CORPORATION**  
215 Lamson St., Syracuse, N. Y.

**COOLANT FILTERS • FILTRATION ENGINEERING SERVICE**



## DANLY Special Die Sets—Ready for mounting the Dies on Specification

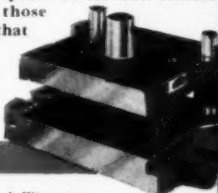


"Mill die seats and recesses; drill mounting holes; mill mounting pads." The work performed on the set shown here is an example of the machining operations that Danly can do for you while your die set is in process. In many cases this necessary machining can be done on the same setup as standard operations on the die set, thereby minimizing setup and handling time.

Additional machining may be specified on any "special" including M-K and A-S sets which can be ordered directly from the Danly Catalog.

This Danly service is especially valuable on large sets. Milling, drilling and boring operations, so easily handled here may cause difficulty in the die shop or your own tool room where equipment is not specifically suited to large work.

Investigate this time saving and cost cutting service. On your next special die set order consider Danly's service for those "extra" operations that can be handled here. Your die set will be delivered "ready for mounting the dies."



DANLY MACHINE SPECIFICATIONS, INC., 2100 So. 33rd Ave., Chicago 16, IL.

Detroit 16, Michigan  
1549 Temple Ave., Cherry 6666  
Rochester 4, New York  
16 Commercial St., Main 2554  
Cleveland 14, Ohio  
1550 East 33rd St., Express 0300

Philadelphia 44, Pennsylvania  
18 West Chelton Ave., Victor 40011  
Long Island City 1, New York  
47-25 Thirty-Seventh St., Ironsides 6-8000  
Dayton 2, Ohio  
990 E. Monument Ave., Fulton 6651

Milwaukee 2, Wisconsin  
111 East Wisconsin Ave., Broadway 1644  
Ducommun Metals & Supply Company  
4098 So. Alameda St.  
Los Angeles 54, California, Kimball 0181

# DANLY Special DIE SETS

MACHINED TO YOUR SPECIFICATIONS



# NEW

*Improved*  
**MODELS**

**PRESS  
RITE  
PRESSES**

New and improved Press-Rite Presses are now ready to meet the exacting demands of present day "stepped up" production. Press-Rite Presses have been tested and approved after many years of service in large and small manufacturing plants.

THE  
*new*  
No. 3  
**30-TON**

**BUILT  
IN  
SEVERAL  
SIZES**

*We solicit your inquiries and will forward complete information upon request. Write to Dept. B-12.*

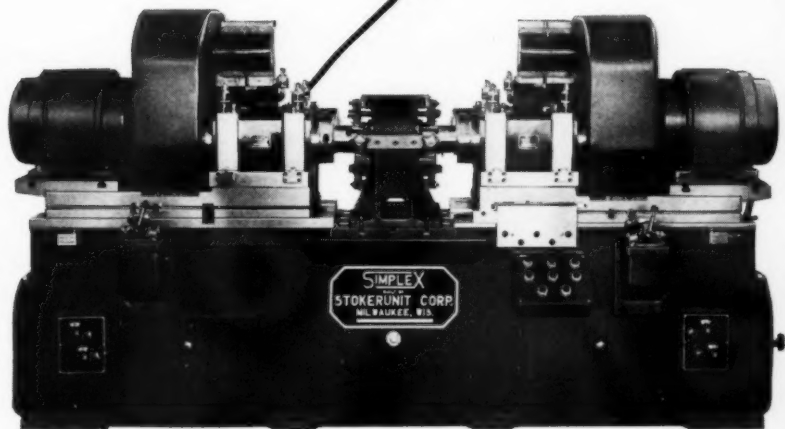
*Sales Service Machine Tool Co.*

2363 UNIVERSITY AVE.

ST. PAUL 4, MINNESOTA

**DIESEL ENGINE CONNECTING RODS** are difficult to bore to modern standards of accuracy and finish. Here, in one machine, all rough and finish boring, facing and chamfering operations are performed in minimum time.

# **SIMPLEX**



The machine is a SIMPLEX 3U 2-way Precision Boring Machine with left-hand table mounted on hardened dovetail ways for rough boring, chamfering and facing one side of both ends. The piece is then reloaded on the right side of the fixture. The right-hand unit finish bores, chamfers and faces the other side. Heavy precision boring spindles, with powerful drives from 7½ HP motors, provide excellent finish and accuracy at low unit cost.

## **Precision Boring Machines**

**STOKERUNIT CORPORATION**

**SIMPLEX Machine Tools Division**

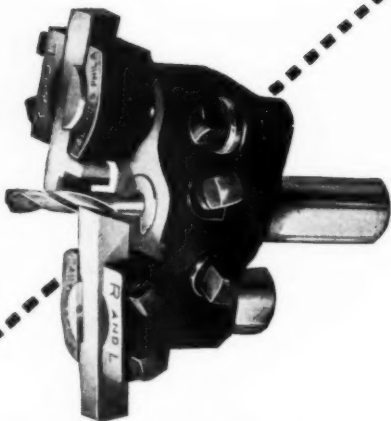
4530 West Mitchell Street, Milwaukee 14, Wisconsin

**Precision Boring Machines, Planer Type Milling Machines and Special Machine Tools**

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

# R and L

# RIGHT-- to



## ---LEFT in 10 Seconds...

with  
R and L  
Turning  
TOOLS

Production savings are important in post-war work. Here is a tool that will save time and money in your shop.

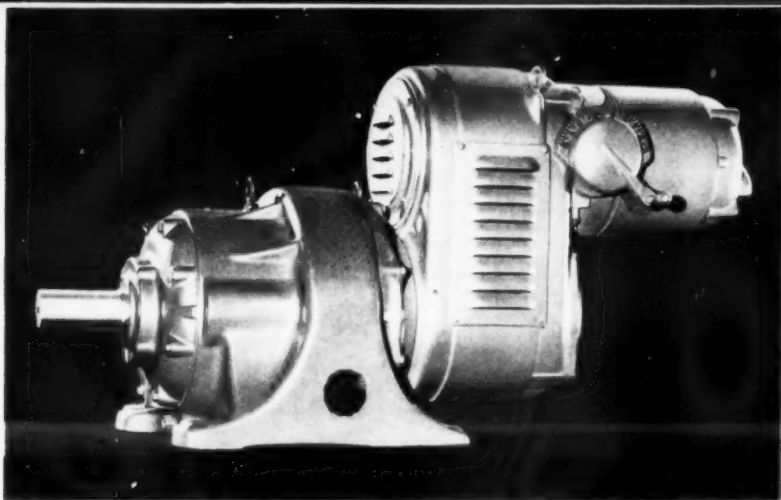
R and L tools increase production by reducing set-up time, by speeding cutting operations, by doing right and left hand turning and by performing several operations simultaneously.

One R and L Turning Tool takes the place of an assortment of 14 separate tools costing 4 times as much! R and L are made in five different sizes . . . and delivery can be made from stock.

Let us send booklet describing R and L Tap and Die Holder, Roller Backrest and Universal Tool Post.

## R AND L TOOLS

1825 BRISTOL ST., NICETOWN, PHILADELPHIA 40, PA.



*Type VEV-GD—Double Reduction Combination Varidrive-Syncrogear*

## THE GEARED MOTOR WITH PYRAMIDAL STABILITY

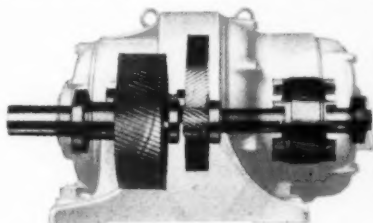
Structural rigidity is of primary importance in a geared electric motor. The U. S. Syncrogear motor consists of a heavy, one-piece pyramidal base casting, within which is mounted the gear trains. Model VEV-GD, illustrated above, shows the Syncrogear in combination with a U. S. Varidrive motor, to obtain very low but variable speeds. You can also obtain the Syncrogear with constant speed motors. In the Syncrogear, electrical design is coordinated to give optimum overall performance. The unit is most compact, occupying little more space than an ordinary motor. It incorporates the basic U. S. Motor features including asbestos protection, normalized castings, solid cast aluminum rotor and Lubriflush lubrication. For ever-dependable geared power, install the U. S. Syncrogear.

## U. S. SYNCROGEAR MOTOR

This diaphanous view shows Type GD Double Reduction U. S. Syncrogear. Note its compactness. Various types of Syncrogears are available, to meet any requirement for geared electric power.

Double, single and triple reductions are available, in sizes of  $\frac{1}{4}$  to 30 h.p. and standard AGMA speeds of 10 rpm to 10,000 rpm.

*New illustrated engineering Bulletin upon request.*



## U. S. ELECTRICAL MOTORS, Inc.

*Atlantic Plant:*  
Milford, Connecticut  
*Pacific Plant:*  
Los Angeles 54, California



*District Offices:* Boston 16;  
New York 6; Philadelphia 2;  
Pittsburgh 22; Chicago 8;  
San Francisco 7; Seattle 4

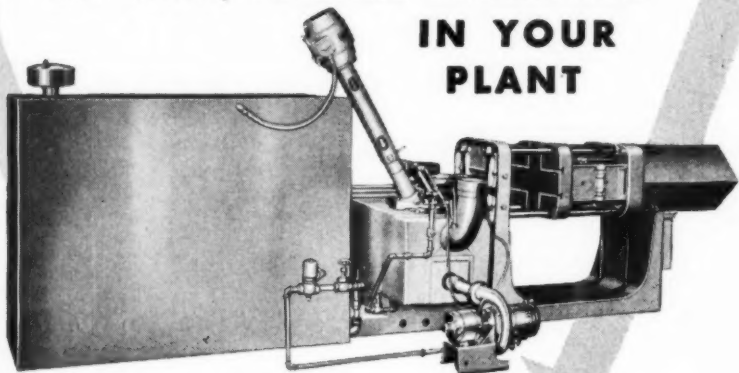
*Sales and Service offices in all principal cities*

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

**NEW**

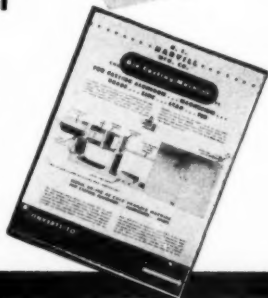
# HARVILL DIE CASTING MACHINES

**CUT COSTS, INCREASE PRODUCTION  
IN YOUR  
PLANT**



**Write for case histories and full  
cost cutting facts today!**

Hundreds of Harvill machines are in use today . . . saving money and speeding production. There is a size and type for every use . . . to cast zinc, tin, lead, aluminum, magnesium and brass alloys. Write on company letterhead for full facts!



**H.L. <sup>RED</sup> HARVILL MFG.CO.**  
CORONA, CALIFORNIA

# **NEW features that mean Better Tapping**

This new high speed Procunier Tapping Head is the answer to your toughest tapping problems. It is a precision machine which assures greater tapping accuracy at high speed — with less tap breakage. Check these new Procunier features:

✓ New double-cone cork faced friction clutch engages the conical surfaces of the drive and reverse shells, driving the tap with a soft "cushioned" action.

✓ New clutch instantly "slips" if tap strikes bottom or sticks—reducing tap breakage.

✓ High sensitivity of Procunier Tapping Head makes it possible to quickly detect dull or "loaded" taps by the pressure needed to drive them.

✓ Procunier Tapping Heads have heat treated gear mechanism, ball bearings, lightweight aluminum housings as well as many other advanced features.

Increased production facilities make it possible for us to guarantee prompt delivery on all orders.

A complete line of Procunier Tapping Heads is available, including Cover Clamping models — write today for illustrated bulletins.



## **Procunier** *Safety Chuck Company*

14 S. Clinton St.

Chicago 6, Ill.



**New  
Procunier  
"Tru-Grip"  
Tap Holder**  
Cross section  
of "Tru-Grip,"  
showing  
positive  
drive to tap.

PROCUNIER SAFETY CHUCK CO.  
14 S. Clinton St., Chicago 6, Ill.

Send me bulletins on

- ☐ Procunier High Speed Tapping Heads  
☐ Procunier "Tru-Grip" Tap Holders  
☐ Universal Tapping Machines

Name.....

Address.....

City..... State.....

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

*Just* **TAPER-BORING COSTS**





**FOR  
TAPER  
BORING**



**FOR  
STRAIGHT  
BORING**



**FOR  
FACING**



**FOR  
OUTSIDE  
TURNING**

**PERFORM FOUR OPERATIONS WITH ONE TOOL**

# **TREE TAPER BORING TOOL**

This tool is the most revolutionary, new and versatile taper boring tool on the market today. Bores holes up to 10" in diameter. Bores tapers faster, more efficiently and at a lower cost. Eliminates hours of set-up and is quickly and easily adapted to the 3 other operations shown above.

**LINCOLN TOOL SPECIALTY CO.**

549 W. Washington Blvd., Chicago 6, Ill.

**NATIONAL DISTRIBUTOR**

**TREE TOOL & DIE WORKS  
RACINE, WISCONSIN**



*Avey's*  
PLUS  
features

add up to **TOP PRODUCTION**

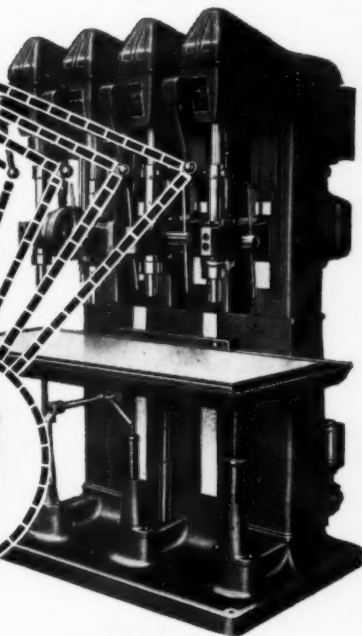
**Six speed changes on the AVEY BMA-6 are made through selective, sliding gears. This automotive type of gear shift is controlled by a single lever at front of machine. Provides versatility and effective operation.**



**CAPACITY**  
Cast-Iron

# 2BMA6— $\frac{3}{8}$ "  
# 3BMA6— $\frac{1}{4}$ "

Single to six spindle machines, equipped with hand feed, power feed or reversing motor tapping.



*plus*

**FINAL SPINDLE DRIVE—VEE BELTS**

Vee belt used on final drive from gear box to spindle. Increases speed and sensitivity in drilling. Carries full horse power from motor to job.

*plus*

**STANDARD MOTOR—EACH SPINDLE**

Each spindle of AVEY BMA-6 individually motor-driven by standard frame constant speed motor. Fast-mounted motor easily interchanged or replaced. Standard motors can be stocked.

*plus*

**SPEEDS OBTAINED—SLIDING GEARS**

Selective, sliding gears of AVEY BMA-6 change speeds quickly and easily. Each gear is manufactured and finished by accurate, modern process, shaved, hardened and lapped. Insures smooth operation and long performance.

**AVEY TYPE BMA-6**

**Four Spindle—12" Overhang**

1st spindle—Avey-matic feed

2nd spindle—Plain power feed

3rd spindle—Hand Feed

4th spindle—Tapping (reversing motor)



**Avey** DRILLING  
MACHINES  
CINCINNATI, OHIO

CLIP AND MAIL TODAY

**AVEY DRILLING MACHINE CO.,  
CINCINNATI 1, OHIO**

Gentlemen: Please send without obligation  
your new Bulletin 647.

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

NAME \_\_\_\_\_

# HERE'S HOW...

TO GET MORE PRODUCTION  
FROM EXISTING MACHINES

## CULLMAN *Speed* REDUCERS

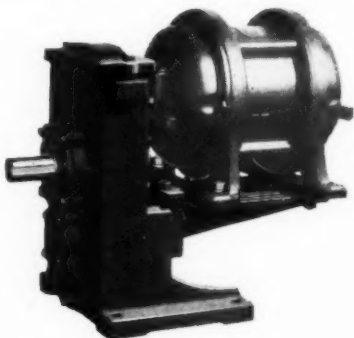
ADAPT ELECTRIC MOTORS TO SLOWER OPERATIONS

New Low-speed Range  
For Motors  $\frac{1}{4}$  To 15 h. p.  
Fit Speeds To Job Needs



### WRITE FOR YOUR COPY...

Get the facts! Ask for this helpful booklet which contains much useful data and facts for buyers. It describes Cullman Speed Reducers and other Cullman products.



Any standard electric motor can be adapted for many new uses by adding a Cullman Speed Reducer. Compact, dependable, efficient—Cullman Speed Reducers are made in single and double reduction types. Cullman units are equipped with Helical Gears, Roller Bearings, Sprockets and Roller Chains all operating in oil. *Installation is simplified by convenient motor mountings.*

## CULLMAN WHEEL COMPANY

1350-W Altgeld Street • Chicago 14, Illinois

# You get these *extra* features in the **JOHNSON** METAL CUT-OFF BAND SAW

***extra* CAPACITY** — 10" high, 18" wide — The added inch or two that can save so much trouble on the occasional extra large job. Takes heavy bars, tubes, angles, flats, gang cutting on small stock.

***extra* STABILITY** — because of the three-point support — no wobble, no twisting strain on bed. Uneven floors don't matter with the Johnson. Move it anywhere you like — casters optional.

***extra* ACCURACY** — because of the unusual stiffness of the machine, and wide guide rolls rigidly held. Cuts square and smooth, and close as you like to finished dimensions. Saves metal and machining time.

***extra* LONG BLADE LIFE** — because the extra large band wheel causes very little twist of blade, and the extreme rigidity of the machine prevents unusual strains on the saw.

Here is a machine that looks as modern as it is — substantial, stream-lined, stable, with that finer finish, greater weight, greater refinement of control, greater dimension of bearings all round, greater convenience of operation, which means it will do more and better work in any shop, all at little or no more first cost. Available with wet cutting attachment if desired.

Ask your dealer or write us direct for illustrated bulletin.

***extra* CONVENIENCE,**

***too*** — faster vise operation, all controls in reach of operator, fine, hydraulically controlled feed adjustment, four speeds, quick-operating stock stop for duplicate work, automatic motor shut-off at end of cut.



**JOHNSON** MANUFACTURING CORP.  
616 CHRYSLER BLDG.,  
NEW YORK 17, N. Y.

# PNEUMATICS INCORPORATED

of Plymouth, Indiana, U.S.A.

These air cylinders are made to your order with any length stroke you request in any of these bore sizes: 1½, 2, 2½, 3, 4, 5, 6, 8, 10

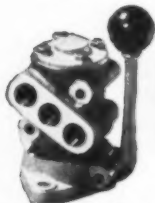
In ordering please write mounting, bore, stroke and piston rod thread you want.



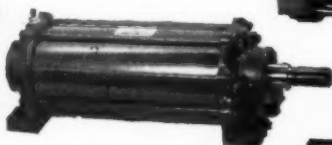
Series "E" Model 1200 Front Flange Mount



Series "E" Model 1300 Rear Flange Mount



Model 5213 Hand Lever Operated Four Way Air Valve



Series "E" Model 1500 Foot Mount

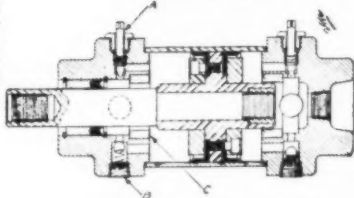


Series "E" Model 1100 Trunnion Mount

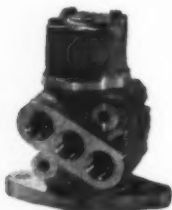
These valves are made to operate double acting air cylinders. They have ½" pipe thread inlet and outlet air ports. They have full size air passages without restrictions that permit the fastest action.



Model 5222 Palm Operated Four Way Air Valve



Metering Needle  
"A" Ball Check  
"B" and Bushing  
"C" May be added if cushion is requested



Plymouth Model 5422 Pilot Operated 4 Way Valve



Model 5323 Foot Operated Four Way Air Valve



Model 5522 Plymouth Single Solenoid Operated 4-Way Air Control Valves

Write for complete list and information

**PNEUMATICS INCORPORATED**  
OF PLYMOUTH INDIANA

CUT AWAY EXCESS METAL...

FASTER

with

*Thor*

**PNEUMATIC  
GRINDERS  
AND SANDERS**

Plenty of power and speed—teamed with smooth, dependable operation—gets more work done in less time—with top accuracy. Thor Grinders and Sanders handle all types of metal removal with maximum economy. Full range of sizes—in speeds from 3,000 to 20,000 r.p.m.

*Call your nearby Thor branch for a demonstration.*

**INDEPENDENT PNEUMATIC TOOL COMPANY**

600 W. Jackson Boulevard, Chicago 6, Illinois

BIRMINGHAM	BOSTON	BUFFALO	CINCINNATI	CLEVELAND	DENVER
DETROIT	HOUSTON	LOS ANGELES	MILWAUKEE	NEW YORK	
PHILADELPHIA	PITTSBURGH	ST. LOUIS	ST. PAUL	SALT LAKE CITY	
SAN FRANCISCO		TORONTO, CANADA		LONDON, ENGLAND	

*Thor*

PORTABLE POWER

**TOOLS**

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY  
ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

89

# AGAIN AVAILABLE!

## "KRIMP SET"

### BARNES METAL CUTTING BAND SAWS

★ 3/4" Width 10-Tooth Blades

★ 3/4" Width 12-Tooth Blades

Discontinued during the war in line with governmental simplification regulations, these Hard Edge Flexible Band Saws are now back again as *standard, regularly stocked Barnes items*. Their worth has been proven on all standard horizontal type saws including Johnson, Wells, Kalamazoo, etc., as well as on standard vertical type machines. These blades greatly increase blade life, cut more accurately and at closer tolerances, eliminate possibility of blade breakage. Available in coils or cut to designated lengths and welded. Your Distributor has both these new "Krimp Set" Band Saws NOW. Order them—try them for greater band sawing efficiency.

#### NOW AVAILABLE

... the 3/4" 18-Tooth Blade with regular set. Specially designed for cutting thin materials. In coils or welded to lengths. Regularly stocked ... fast delivery.

"KRIMP SET" is Barnes designation for "Wavy Set"



ESTABLISHED 1919

## W. O. BARNES CO., INC.

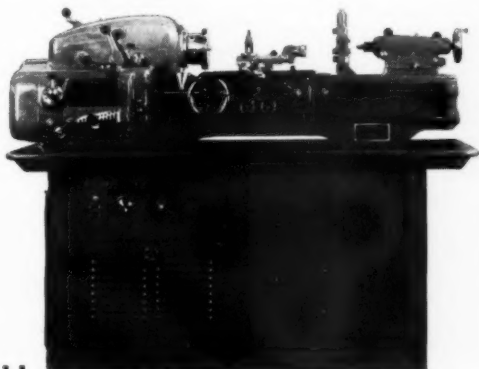
DETROIT 14, MICHIGAN

# THE NEW HENDEY 9"x24"

## TOOL AND GAGE MAKER'S LATHE

### GIVES YOU THESE LONG-WANTED FEATURES

- |                        |   |
|------------------------|---|
| 1. Greater Capacity    | 1½" maximum capacity of Spring Collets.                       |
| 2. Finer Control       | 66 different feeds, 66 different threads without gear change. |
| 3. Higher Speed        | Up to 2000 r.p.m. forward and reverse.                        |
| 4. Greater Sensitivity | Stepless speed over entire range provided by DC power unit.   |



### AND MORE...

To insure precise production the new Hendey 9"x24" has these additional features. Hardened and ground spindle runs in super precision, preloaded, anti-friction bearings. The lead screw is held to .0005" per foot of lead and is used only for thread cutting. A separate feed rod, independent of the lead screw, is provided. Lubrication is automatic throughout.

The new Hendey 9"x24" is the precision lathe that fulfills a long standing desire of tool and gage makers everywhere. Full information on this highly accurate, sensitive and versatile lathe, is contained in the new 9"x24" catalog - send for it today.

The Hendey Machine Company

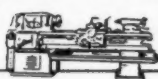
*Hendey*

Main Office and Plant - Torrington, Connecticut

Offices - N. Y., Chicago, Boston, Detroit, Rochester, Los Angeles, San Francisco

Representatives in - Philadelphia, Cleveland, Pittsburgh

TOOL ROOM LATHES  
12" - 14" - 16" - 18" - 20"



SHAPERS  
12" - 16" - 20"



## slow speed, high torque portable electric power unit

This inexpensive, reversible, power unit, operating on either AC or DC current, develops, through slow speed gearing, a tremendous rotating power.

Portable and versatile — this CP tool is shown above operating as a flue roller, but it has many other uses, such as the operation of winches, gate valves, heavy

drills, reamers, milling cutters, etc.

If you have an application that calls for a slow speed, high torque,

extremely powerful, portable electric unit, write for further information on this CP specialty.



**CHICAGO PNEUMATIC  
TOOL COMPANY**

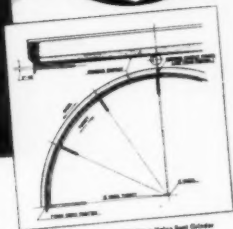
General Offices: 8 East 48th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES  
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

# PRODUCTION IS 4 TO 10 TIMES GREATER on a FITCHBURG



**CONSTA-CONTACT GRINDER**



SCHEMATIC DIAGRAM of Grinding Valve Seat Grinders

## A BASICALLY NEW, MORE PROFITABLE METHOD FOR MASS-PRODUCTION CYLINDRICAL GRINDING

**THE SIMPLE PRINCIPLE:** Work pieces are automatically fed into 12 quill-type spindles on the periphery of a rotating turret. For one-quarter revolution of the turret, each rotating piece bears against the rotating wheel face. The pieces are automatically released on the downward arc and conveyed out of the machine. **THE GRINDING PROCESS IS CONTINUOUS** and the relative position of the turret and the wheel gives **AUTOMATIC SELF-ADJUSTING FEED** and **AUTOMATIC SIZE CONTROL**.

**THE COST-CUTTING PRODUCTIVE RESULT:** The FITCHBURG CONSTA-CONTACT Valve Seat Grinder shown above will grind the seats of automotive valves—from the rough forging to the finished size—without any necessity to deburr—at the rate of 2160 per hour—a rate vastly greater than possible by any other present method.

The inherent speed and economy of CONSTA-CONTACT GRINDING is best utilized in comparatively large-scale production. Present capacity is any part that can be chucked that is not greater than 3" dia. x 7" long.

Your inquiry for further information about CONSTA-CONTACT GRINDING—and a possible application of this new profitable grinding principle to your products—is invited.

## Features:

- ★ No "grinding air" time loss—3 or more parts are always "sparking" (the greater the stock removal, the more parts are "sparking").
- ★ Automatic Size Control.
- ★ Actual sparking time is the same as that of other present methods—but CONSTA-CONTACT grinds 3 or more pieces in the sparking time required by one piece.
- ★ Work can be chucked or held on short centers.
- ★ Wheel can have both coarse and fine cutting surfaces—to rough and finish-grind in one pass.
- ★ Wheel can be formed to grind several diameters and shoulders—exactly as in present-day formed-wheel grinding.

**FITCHBURG GRINDING MACHINE CORP.**  
FITCHBURG, MASSACHUSETTS, U.S.A.

Manufacturers of: Bar Grinders, Wheelhead Units, Multiple Feed Grinding Units, Spindle Grinders, Cylindrical Grinders, Gear Grinders, Bench and Universal Grinders and Special Purpose Grinders



# Made for Service...



## HARGRAVE TESTED TOOLS

**T**HESE fine tools are truly tested . . . in the Hargrave plant and in service in the field. Hargrave Tested Tools are standard equipment in the nation's leading plants . . . the favorites of craftsmen since 1879.

WRITE FOR CATALOG SHOWING COMPLETE LINE

*The* **CINCINNATI TOOL Co.**

1945 Waverly Avenue

Cincinnati 12, Ohio

### WELDERS' CLAMP No. 43



The Hargrave No. 43 Welders' Clamp has a patented anti-spatter screw made of a solid alloy . . . permanently resists loading (not coated).



### NEW CARRIAGE CLAMP No. 530



Made of a powerful new metal. Stronger than malleable iron clamps. Openings from 3" to 8".

### IMPROVED "I" BAR CLAMP (Patented)

Bar is high-carbon manganese steel. Slide, Tip, Frame and Crank are best grade of malleable. Openings from 2 to 10 feet.



### CHISELS — PUNCHES

Forged from alloy steel in all standard sizes. Individually Tested.

Another KENNAMETAL  
Development...

# ONE KENNAMETAL Grade **K6** Will do your Cast Iron Jobs

One versatile Kennametal grade—K6—has *all* the characteristics required for practically every cast iron machining job. It performs equally well on roughing, finishing, or precision boring.

★ K6 has the strength to withstand the shock of machining tough, sandy, or chilled castings, even when they are out of round, or have surface interruptions.

★ K6 has high hardness to resist abrasion, and to hold its edge for long periods of cutting.

These properties are uniformly maintained by distinctive manufacturing processes.

Extracts from typical performance reports:

★ "K6 removes metal from chilled cast iron piston trunks at tool cost of 74¢ per ton."

★ "40 webbed flanges turned between grinds with K6, whereas one to four pieces was best performance of carbide previously used."

★ "K6 turns out 11½ times as many pieces between grinds."

★ "With K6 we have tripled the feed, doubled the cutting speed, and are facing 8 times as many sandy iron castings."

The best way to prove that K6 can reduce your tooling costs, and increase your production is to try it in your shop—then compare tool performance and overall costs. Ask your nearest field engineer to advise you.



**KENNAMETAL**

SUPERIOR CEMENTED CARBIDES

KENNAMETAL Inc., LATROBE, PA.

THERE'S A  
KENNAMETAL  
TOOL

with a **TIP**  
FOR EVERY CAST IRON  
CUTTING JOB



↑  
STRONG, HARD

**K6**  
SAVES TIME  
AND TOOLING COSTS  
ON BOTH JOBS  
↓



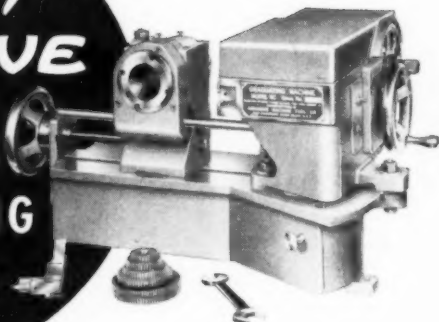
STRONG, HARD

**K6**  
EXCELS ON  
INTERRUPTED  
CUTS



When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

*Announcing*  
**ABRASIVE**  
 MODEL GC  
**CIRCULAR  
 GRADUATING  
 MACHINE**



The Model GC CIRCULAR GRADUATING MACHINE accurately and quickly graduates hand wheels, dials, knobs and similar parts. This machine is capable of a wide range in the number of possible graduations — including all commonly used English graduations, Metric graduations, and "Degree" graduations. The type of graduation can likewise be readily changed to conform with the requirements of any of these systems.

The actual cutting of the graduations is performed by a single-point tool which produces a clear, sharp line of almost any desired length or combination of lengths. Spacing of the graduations is controlled by a set of change gears and through a worm and worm wheel, assuring "Dividing Head" accuracy. Graduations parallel with the axis of the work and angular graduations up to 45° can be cut.

The unit is power driven which results in uniform, rapid production. Tests have shown that 55 hand-wheels, with 100 graduations on each, can be graduated in one hour. An automatic cut-out stops the machine at the end of each cycle so that after the setup is completed it is merely necessary for the operator to take off one piece and put on the next. To change the setup from one size and type of work to another is but a matter of minutes. It is only necessary to put on the proper change gears, the proper graduating cams and work holder, then set the depth of cut and proceed.

**ABRASIVE MACHINE TOOL CO.**  
 EAST PROVIDENCE 14, R. I., U. S. A.

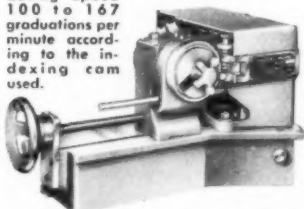
**SPECIFICATIONS**

**CAPACITY**

Smallest diameter graduated with std. equip. 1 1/2". Largest diameter graduated with std. equip. 20". Will graduate straight dials or angular dials up to and including 90° included angle. Maximum diameter for angular dials varies with the work, i.e. for 60° included angle, the maximum diameter is approx. 18"; and for 90° included angle, the maximum diameter is approx. 15". Length of graduation 0" to 3 1/2".

**SPEED**

Cutting speed 100 to 167 graduations per minute according to the indexing cam used.

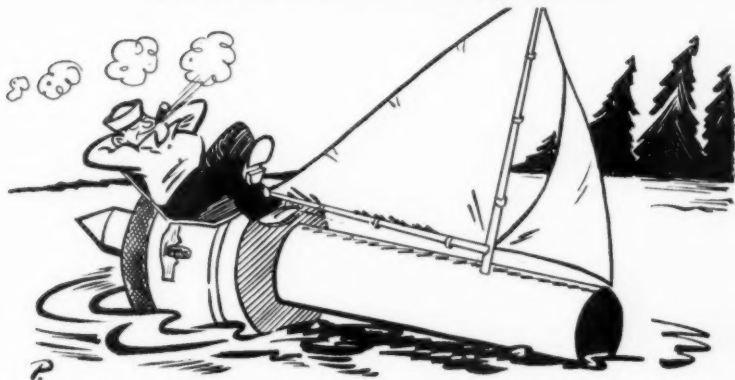


Model GC machine set up to graduate an aluminum dial which has a knurled rim extending above the graduated surface.

**ABRASIVE**

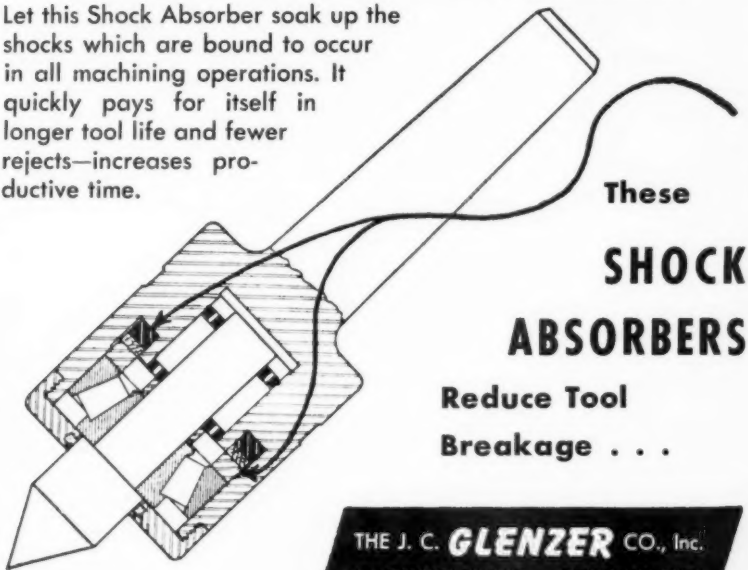
ACCURACY BOOSTS PRODUCTION

**It's Smooth Sailing with**



## **GLENZER Precision Live Centers**

Let this Shock Absorber soak up the shocks which are bound to occur in all machining operations. It quickly pays for itself in longer tool life and fewer rejects—increases productive time.



These  
**SHOCK  
ABSORBERS**

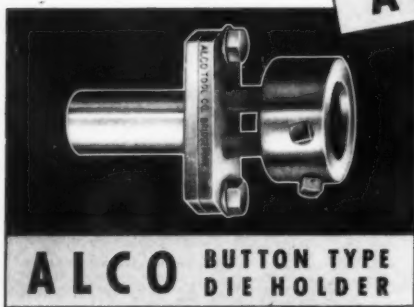
**Reduce Tool  
Breakage . . .**

THE J. C. **GLENZER** CO., Inc.

6465 EPWORTH BLVD. DETROIT 10, MICH.



*I can set up* **FAST**  
*with these* **ALCO**  
**DIE HOLDERS**



PROMPT SHIPMENTS NOW  
ON BOTH TYPES

The self-aligning feature of Alco Die Holders is pointing the way for wise manufacturers to cut costs by reducing set-up time. Only three things to do . . . tighten die in die cap . . . run die slowly on work for correct alignment . . . tighten two studs in the flange and start production.

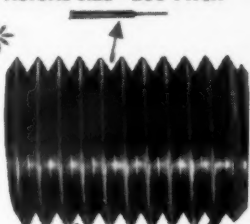
And don't overlook the lowly button die . . . it's simple but efficient when used in the Alco Button Die Holder.

**ALCO** EFFICIENT **TOOLS**

**THE ALCO TOOL CO.**  
**252 Birdseye St., Bridgeport, Conn.**

Watchmaker Precision  
+  
Production Line Method  
=  
**VERS-O-TOOL**

ACTUAL SIZE—260 PITCH

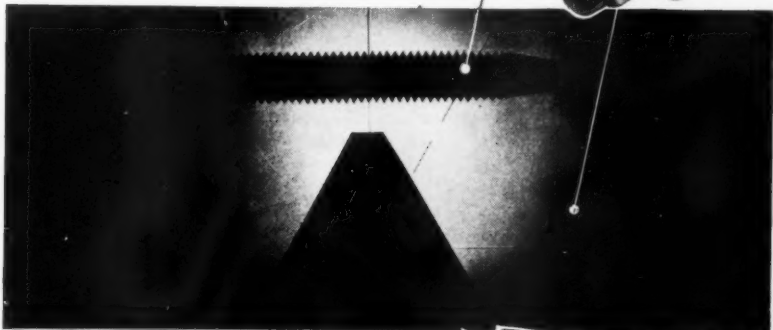
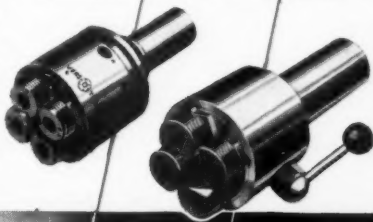


\*260 threads per inch on a .038" diameter! Only the Vers-O-Tool can deliver that kind of accuracy on a production job—because the Vers-O-Tool is the *only* ground-thread circular-cutter automatic die head made in such a small size.

Regardless of size, when you're threading with a Vers-O-Tool, you'll get fewer rejects, higher production—and *lower costs*. Chasers last longer (they're regrindable through a full

270°). What's more, they're *ground* accurate to begin with—and they re-grind accurately.

May we give you more complete information? Write for catalog D-42-C.



**The NATIONAL ACME CO.**

170 EAST 131st STREET • CLEVELAND 8, OHIO

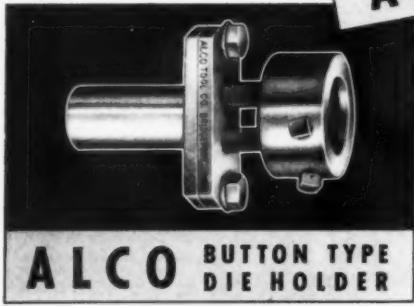
Acme-Gridley Bar and Chucking Automatics:  
T-4-G and B Spindle • Hydraulic Thread  
Rolling Machines • Automatic Threading Dies  
and Taps • The Chronolog • Limit Motor Starter  
and Control Station Switches • Solenoids  
Centrifuges • Contract Manufacturing



*I can set up* **FAST**  
*with these* **ALCO**  
**DIE HOLDERS**



**ALCO** ACORN TYPE  
DIE HOLDER



**ALCO** BUTTON TYPE  
DIE HOLDER

PROMPT SHIPMENTS NOW  
ON BOTH TYPES

The self-aligning feature of Alco Die Holders is pointing the way for wise manufacturers to cut costs by reducing set-up time. Only three things to do . . . tighten die in the cap . . . run die slowly on work for correct alignment . . . tighten two studs in the flange and start production.

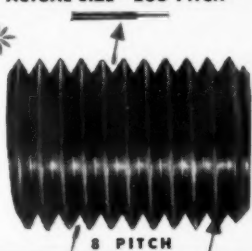
And don't overlook the lowly button die . . . it's simple but efficient when used in the Alco Button Die Holder.

**ALCO TOOLS**  
EFFICIENT

**THE ALCO TOOL CO.**  
252 Birdseye St., Bridgeport, Conn.

Watchmaker Precision  
+  
Production Line Method  
=  
**VERS-O-TOOL**

ACTUAL SIZE—260 PITCH

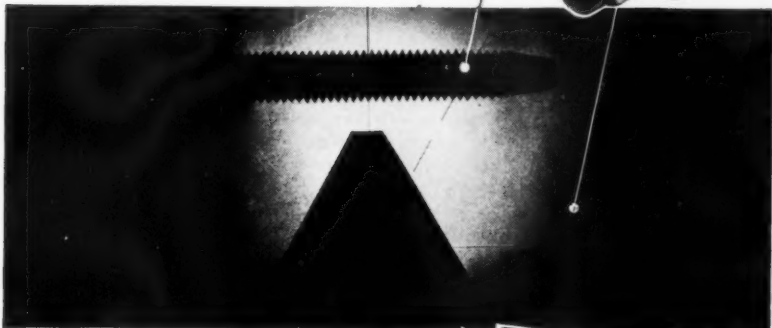
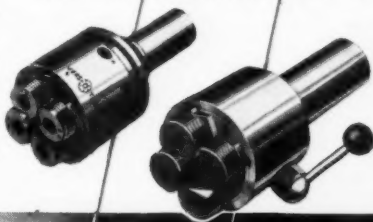


\*260 threads per inch on a .038" diameter! Only the Vers-O-Tool can deliver that kind of accuracy on a production job—because the Vers-O-Tool is the *only* ground-thread circular-cutter automatic die head made in such a small size.

Regardless of size, when you're threading with a Vers-O-Tool, you'll get fewer rejects, higher production—and *lower costs*. Chasers last longer (they're regrindable through a full

270°). What's more, they're *ground* accurate to begin with—and they re-grind accurately.

May we give you more complete information? Write for catalog D-42-C.



**The NATIONAL ACME CO.**

170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Checking Automatics:  
1-4-G and 8 Splindle • Hydraulic Thread  
Rolling Machines • Automatic Threading Dies  
and Taps • The Chronolog • Limit Motor Starter  
and Control Station Switches • Solenoids  
Centrifuges • Contract Manufacturing

# Continental COUNTERBORE SETS

A Size  
For Every  
Purpose



THE indestructible drive and rigid, yet simple, construction of the Continental Interchangeable Counterbores assure long dependable service.



CONTINENTAL Interchangeable Counterbores are now available in a choice of three sets, each providing a wide variety of useful, dependable tools. In complete yet compact form, you will find a selection designed to fill the needs of the large or small toolroom. Set No. 1 (illustrated), for the small shop, includes cutters up to  $1\frac{1}{16}$ " diameter, with two holders. Whichever set you choose, you will get fine, precision-made cutting tools.

**CONTINENTAL TOOL WORKS**

Division of Ex-Cell-O Corporation  
DETROIT 6, MICHIGAN



## Continental CUTTING TOOLS

Boring Bars and  
Tools

Broaches  
Broach Pullers  
Broaching  
Fixtures

Core Drills

Counterbores  
and Countersinks

CTW Drive  
Holders

Counterbores  
(Tool Room Sets)

Counterbore  
Files

Inserted Blade  
Cutters

Carbide Tipped  
Cutters

Form Relieved  
Cutters

Milling Cutters

Thread Milling  
Cutters

End Mills

Side Mills

High Speed Steel  
Reamers

Carbide Tipped  
Reamers

Shell Reamers

Inverted  
Spotfacers

High Speed Steel  
Tool Bits

Carbide Tipped  
Tool Bits

Circular Form  
Tools

Cut-off Tools

Flat Form Tools

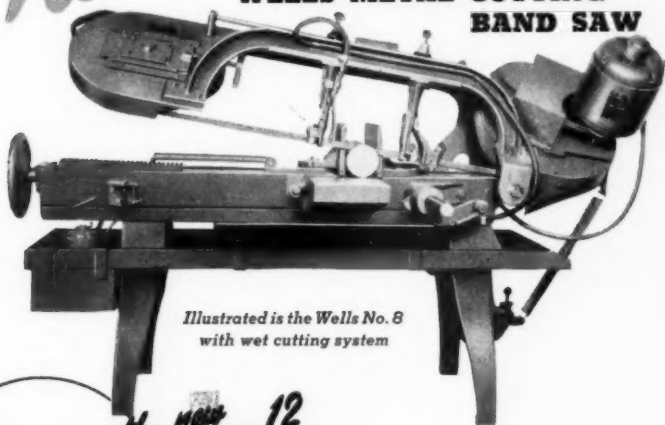
Deviseil  
Form Tools

46-44

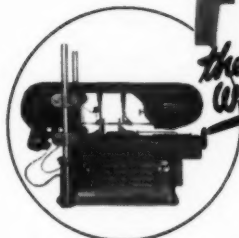
there is

*No Lost Time*

when you cut with a  
**WELLS METAL CUTTING  
BAND SAW**



*Illustrated is the Wells No. 8  
with wet cutting system*



*the new  
Wells no 12*

The revolutionary new Wells No. 12 features an automatic hydraulically controlled cutting cycle and controlled blade pressure. It will handle rectangular shapes up to 12" x 16" and rounds to 12 3/4" O.D. It operates at selective speeds of 60, 90 and 150 feet per minute.

You'll get the job done faster with a Wells Band Saw because the cutting action is continuous. There is no wasted motion. Service records in hundreds of leading plants prove that Well Saws reduce cutting time, yet they are versatile and economical. Ask your dealer for a demonstration or write direct.

#### **Specifications—Wells No. 8**

##### **CAPACITY:**

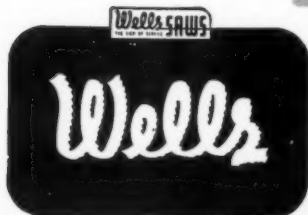
Rectangular	8" x 16"
Special Guides	5" x 24"
Rounds	8" O. D.

**MOTOR** . . . . . 1/2 H.P., A.C. or D.C.

**SPEEDS** . . . . . Selective; 60, 90, 130 feet per minute

**WEIGHT** . . . . . Approximately 665 pounds

*Products by Wells are Practical*



**METAL CUTTING  
BAND SAWS**

**WELLS MANUFACTURING CORPORATION  
707 COOLIDGE AVENUE, THREE RIVERS, MICHIGAN**



*A Smooth Performer*



## NO. 11 LEACH SURFACE GRINDER

For smooth performance . . . for flexibility  
. . . for fast, accurate production, the  
rugged No. 11 Leach Surface Grinder is  
unequalled — anywhere!

**You can depend on  
Leach engineering!**

**EXTRA LARGE CAPACITY**

**6" x 24" x 12"**

**HEIGHT 52"**

**WEIGHT 850 lbs.**

**2 SPINDLE SPEEDS**

**2600 and 3500 R. P. M.**

**\$750.00**

Complete with motor of standard  
current characteristics F.O.B. Factory

For further information write Dept. C

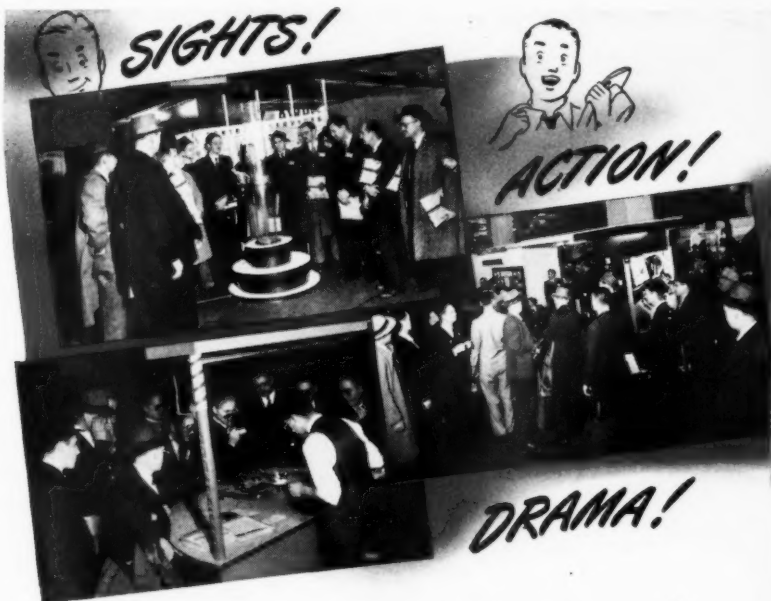
WORLD DISTRIBUTORS

# H. LEACH MACHINERY CO.

387 CHARLES STREET

PROVIDENCE 4, R. I.

AGENTS IN ALL PRINCIPAL CITIES



**It's sure to be a box office hit for all exhibitors  
at the Tool Engineers' Industrial Exposition in Cleveland, Ohio, next March 15-19!**

**Highlights:** Presented by the American Society of Tool Engineers, the last Exposition drew thousands of executives, industrial engineers and tool engineers. A record we're proud to claim!

**Action:** Among those who will attend the Exposition next March will be the men who dictate what shall be bought and from whom. Sales action aplenty—bring your top engineers!

**Drama:** New processes, advanced methods, fresh approaches and inspiring ideas . . . provide drama by America's leading manufacturers. Plant tours, technical meetings, industrial movies, exhibits. It's ASTE's most spectacular Industrial Exposition yet!

#### **Extra Program Feature**

Coincidental with the Exposition, ASTE members will meet for their 16th Annual Convention and technical sessions in Cleve-

land. It's your big chance to sell the tool engineer.

#### **Preview of coming attractions!**

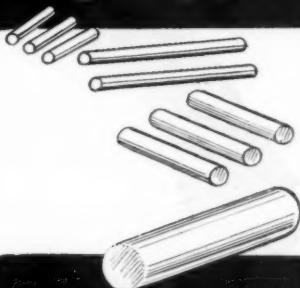
**TIME:** March 15-19 • **PLACE:** Public Auditorium, Cleveland, Ohio • **PRODUCED BY:** American Society of Tool Engineers • **DIRECTED BY:** America's leading manufacturers • **STAR PERFORMERS:** All Tool Engineer Industrial Exposition exhibitors • **PRICE:** No advance in prices • **RESERVATION:** Write immediately.

**For complete information, write**

**EXPOSITION COMMITTEE  
AMERICAN SOCIETY  
OF TOOL ENGINEERS**

**1666 PENOBSCOT BLDG.  
DETROIT 26, MICHIGAN**

# Precision ROD CUTTING at High Speed



## with the New DI-ACRO ROD PARTER

This newest member of the DI-ACRO family of "DIE-LESS DUPLICATING" Machines brings you accuracy, speed, capacity range and ease of operation fully up to the standards established by DI-ACRO Precision Benders, Brakes, Shears.

**Do you require precision?**—The DI-ACRO Rod Parter holds tolerance to .001" on duplicated cuts. The ends are square, and roundness is maintained.

**Do you want speed?**—The Rod Parter exceeds output of other methods with equal accuracy, on rods and bars up to 5". Torrington Roller Bearings incorporated in an exclusive multiple leverage arrangement provide remarkable ease of operation.

### GET "DIE-LESS DUPLICATING" CATALOG!

Shows parts produced without die expense or delay by DI-ACRO Benders, Brakes, Shears, Rod Parters, Notchers, Punches. Send for your free copy.

Pronounced "DIE-ACK-RO"

#### "PARTS OFF" MANY MATERIALS

All hot and cold rolled rods

Stainless steel

Chrome Molybdenum

Copper

Brass

Aluminum

Bi-metals

Many types of plastics

Fibre Rubber Wood



## O'NEIL-IRWIN MFG. CO.

314 EIGHTH AVENUE • LAKE CITY, MINNESOTA

## STANDARD HORIZONTAL SLIDE TOOL

### ... With Overhead Pilot

Designed for use on the 5D2-12" and the 5D2E-15" machines — with T-slot on center with the spindles, maximum rigidity is secured by the overhead Pilot. These fixtures are available for both five and six face Turrets. The obvious sturdiness and rigidity of the horizontal slide for holding the cutter blocks is assurance of rapid and accurate stock removal to the limit of the cutters. The Slide Tool T-slot has ample space for cutter blocks to machine work pieces at the front and at the rear of the double-spindle, double-production machines.

This Slide Tool also may be used for internal recessing cuts, as well as for taper boring or turning with the proper cam path fastened to Cross Slide Base of the bed of machine.

Production cost will be a critical factor in the post-war world. This helpful catalog will present you with many constructive ideas that will assist you in making your Potter & Johnston machines more productive. If you are a user of our machines it will be sent to you, on request.

This versatile tool is one of a broad line of production aids available for reducing manufacturing costs.

*The* **POTTER & JOHNSTON**  
**MACHINE CO.** PAWTUCKET, RHODE ISLAND



# Even if we split the difference . . .



## These new Speed-Wet Discs are cutting 5 to 1 Better!

Actually the field engineer's report stated 4 to 6 better! Here's the "before and after" comparison. The job: grinding stove frames. Previous production average: one frame per disc. New production rate with Speed-Wet Metalite Fibre Discs: 4 to 6 frames per disc. Purchasing agent instructed: furnish "Behr-Manning only" on all future disc requisitions.

Ever since we released the new Speed-Wet Disc, we have received glowing reports like this from the field. Technically, the explanation of this extra production lies in three quality features: first, all-resin bonding for resistance to heat; second, all-Durabonded® coating for rugged grit anchorage; third, all-fibre backing for extreme flexural strength.

Thus there is every possibility that a job test of Speed-Wet Disc on your own work will improve your production too. We'll be glad to arrange it at your convenience — just write us on your company letterhead.

© Reg. U. S. Pat. Off.

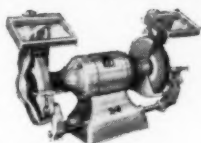
*watch for*  
**SERVICE  
PACKAGING**

**BEHR-MANNING**  
(DIVISION OF NORTON COMPANY)  
TROY, N. Y.





Heavy Duty Drills



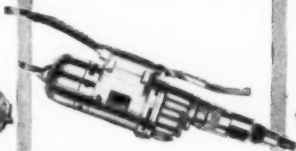
Bench Grinders



"Dyno-Mite" Drills



Hammers



Screw Drivers



Nut Runners



Portable Grinders



Disc Sanders  
and Polishers



Constant improvements and refinements make these Millers Falls electric tools the logical choice for the job of

**PRODUCING MORE AT LOWEST COST.**

The Millers Falls Electric Tool Catalog gives full information; it's yours for the asking.

**MILLERS FALLS COMPANY**

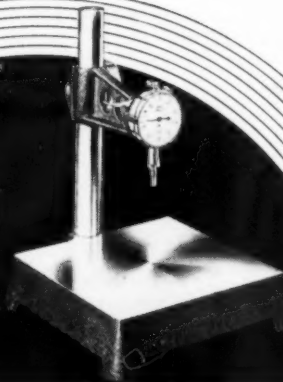
**GREENFIELD**



**MASSACHUSETTS**

The logo consists of the word "AMES" in a stylized, bold, serif font, enclosed within a semi-circular arch.

DIAL COMPARATOR No. 13  
LONG RANGE INDICATOR No. 202



## DECIMALS AND DOLLARS

When you want to measure those decimals with maximum dollar savings, do it with an AMES DIAL COMPARATOR such as Model No. 13 shown above. Quickly and easily set to the required dimension. Maintains its setting even with rough usage. Gives instant, *accurate* readings — independent of the human factor. You'll find no other Comparator gives you such high production while saving so much in time and labor.

The 8"-square cast-iron base may be fitted with V-blocks, anvils, or stops of various kinds. The indicator-holding bracket extends 4" over the base and is easily adjustable on the 9" column. Measuring capacity is 6". Net weight 16 lbs.

The indicator shown is one of a complete line of AMES Long Range Indicators from which you may select exactly the graduations, range, and dial reading best suited to your needs.

For information on our full line of Comparators and many other measuring instruments, address our Home Office:

28 Ames Street, Waltham 54, Mass.

### B. C. AMES CO.

Mfr. of Micrometer Dial Gauges  
Micrometer Dial Indicators

*Representatives in  
principal cities*



# HANNIFIN

## Another "SPECIAL" HYDRAULIC CYLINDER!

—out of the Standard Hannifin Line

It's *special* because it's built to YOUR specifications! You can have any length stroke you want . . . a choice of mounting styles to meet your needs . . . bore diameter to fit the job . . . standard, double end, or heavy duty (2:1) piston rod . . . adjustable cushions . . . inlet ports on any side . . . air vents wherever needed — all "special" for YOU.

But it's *standard* with Hannifin because the Hannifin line of hydraulic cylinders is COMPLETE! For users of cylinders, this means lower engineering costs . . . quicker delivery . . . completely interchangeable parts . . . better design . . . superior performance.

It pays to specify HANNIFIN!



Model JN  
One of 11 different  
mounting styles.



EVERY DESIGN ENGINEER WILL WANT  
A COPY OF THIS NEW BULLETIN.

It's easy to get the right answer for even the most special jobs when you use Hannifin's new handbook on hydraulic cylinders. 52 pages of helpful specification and engineering data, complete with diagrams and dimensions.

Ask for Bulletin 110-Z.

**HANNIFIN**

Nationwide  
Sales and  
Service

## HANNIFIN CORPORATION

1101 So. Kilbourn Ave., Chicago 24, Ill.  
AIR CYLINDERS • HYDRAULIC CYLINDERS • HYDRAULIC PRESSES  
PNEUMATIC PRESSES • HYDRAULIC RIVETERS • AIR CONTROL VALVES

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

109

TOUGHNESS  
LONG LIFE  
POWER

PROTECTION  
DURABILITY  
BALANCE



C/R Hammers have malleable iron heads with replaceable coiled rawhide faces.

**RAWHIDE** is tops for "soft" mallets and hammers. And you can't beat *Chicago Rawhide*. Tightly coiled, specially treated C/R surfaces won't split, crumble or mushroom. They absorb shock, deliver powerful blows, protect delicate surfaces, and stand up under tough use. Always ask for *Chicago Rawhide*.



**CHICAGO** *Rawhide* **MFG.CO.**

1321 ELSTON AVENUE

CHICAGO 22, ILLINOIS

Other C/R maintenance products are: round, flat and twist belting; belt pins and belt lacings; gears, pinions and gear blanks; aprons and hand leathers; hydraulic packings.

**OPERATORS HANDLE . . .**



**Less Weight  
More Power**

with a

**Mall**  
REG. U.S. PAT. OFF.

**FLEXIBLE SHAFT GRINDER**

As the motor is mounted on an easy-rolling floor stand or overhead trolley, the working tools on a Mall Flexible Shaft Grinder are lighter in weight, more compact, more comfortable to hold, easier and less tiresome to handle. This means fewer rest periods—more time on the job. Spots can be reached that are inaccessible to heavier, more cumbersome self-contained motorized tools. More than this, every Mall motor is dynamically balanced at the factory to assure true concentric motion in the tool. Attachments for Grinding, Disc Sanding, Wire Brushing, Buffing, Polishing and Drilling are interchangeable. Available in 3 H.P. Geared Head—4500 r.p.m.;  $\frac{3}{4}$ , 1,  $1\frac{1}{2}$  H.P. Direct Drive—3450 r.p.m.; and  $\frac{3}{4}$  H.P. Counter-shaft models—1650 to 7400 r.p.m. All with tilting, swiveling, dustproof electric motors.

Ask your Supplier or write Power Tool Division for literature.

**MALL TOOL COMPANY**

**7742 South Chicago Avenue**

**Chicago 19, Illinois**

**26 Years of "Better Tools For Better Work"**



Dust will cause trouble. Eliminate abrasive dusts  
in your plant with:

## **TORIT** DUST COLLECTORS



TORIT Dust Collectors work effectively and economically. Completely self-contained, they are installed at the machine. No extensive piping is necessary, and the cleaned air is recirculated.

TORIT Dust Collectors are compactly designed. They fit all production layouts and may be moved as needed. Stock sizes, ranging from  $\frac{1}{2}$  HP to 3 HP, and fitting all grinding, cutting and polishing machines, are available for quick delivery. For details and the latest TORIT catalog write:

**T O R I T**  
**MANUFACTURING CO.**

303 WALNUT ST. • ST. PAUL 2, MINN.

*Back  
Again*

BY POPULAR REQUEST



SCULLY-JONES

EXTENSION SOCKETS

STYLE 100-W

## *Reduce* the COST OF TOOLING

You can convert spindles to larger or smaller tapers—and extend the spindles in your present Drill Presses, Radial Drills, Turret Lathes, Boring Mills, etc.—to utilize their productive capacity to a greater extent.

**IMMEDIATE DELIVERY**  
ON ALL POPULAR SIZES

### **LONGER WEAR AND BETTER PERFORMANCE**

Made to exact specifications. The tang and hole ends are heat-treated for longer wear and maintenance of concentricity. They will outlast the ordinary soft sockets and perform with greater accuracy

FURNISHED WITH MORSE TAPER HOLES AND SHANKS

*Three Series* LONG • MEDIUM • SHORT

***Scully-Jones***  
AND COMPANY

For details see page 215  
in Scully-Jones Manual 500



1007 SOUTH ROCKWELL STREET, CHICAGO 8, ILLINOIS

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

113

54875-1-45



more and more  
in wrenches  
the name is

# BILLINGS

## WRENCHES

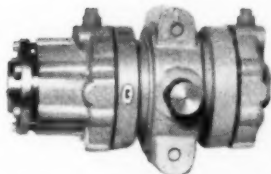
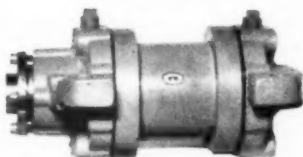
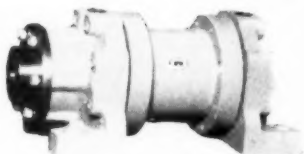


Buy them from your Mill  
Supply or Hardware Dealer



THE BILLINGS & SPENCER CO., HARTFORD 1, CONNECTICUT, U. S. A.  
MACHINE and TOOL BLUE BOOK

December, 1947



## HYDRAULIC CYLINDERS

Air — Oil — Water

Pressures—150 psi to 3000 psi

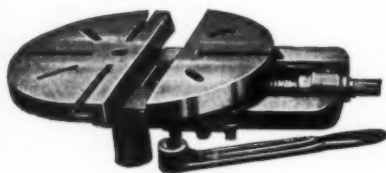
Standard Diameters—1" to 14" Other Diameters to 24"

*Deliveries Will Surprise You!*

*Some Desirable Distributors' Territories Open*

**POWER PLUS PRODUCTS COMPANY, Detroit 7, Michigan**

# Use the COMBINATION DRILL TABLE and VISE



## **SPEEDS DRILL PRESS SET-UPS**

Simplifies the most difficult set-ups. Holds work of all shapes securely, without angle plates, clamps or supports. Just drop in the work and start to drill.

The Combination is made in various sizes — diameters from 8" to 27½", weighing from 27 to 600 lbs. Made of the finest materials, for long life. Easy to install. Specify shank diameter in thousandths of an inch. We supply the drill table and vise with shank turned to size specified.

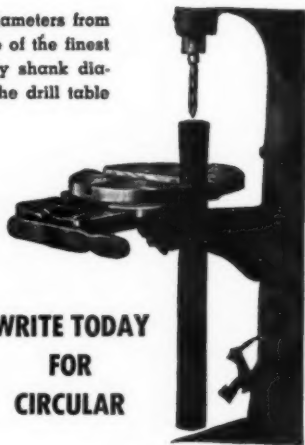
## **GUARANTEE**

We guarantee the Combination will save its cost in labor alone in six months. You are the judge.

## **FREE TRIAL**

We will ship to rated concerns under this guarantee, on free trial. Should you decide not to keep the tool we will even pay return transportation. Order Today!

**Circular on Request.**



## **WRITE TODAY FOR CIRCULAR**

*Gives full information and illustrates typical, set-ups. Shows use on radial drills. Complete specifications of all models including the square, all steel tables.*

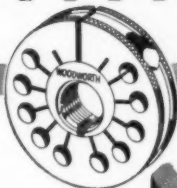
**MODERN MACHINE TOOL CO.**  
*Jackson, Michigan*

# WOODWORTH GAGES *ACCEPTED* BY ALL INDUSTRY . . . . . !

GREEN—GO



RED—NOT GO



Industry by industry—coast to coast—  
wherever accuracy and durability count—  
Woodworth Company is winning and  
holding new friends—with the **ACCEPTED  
ADJUSTABLE THREAD RING GAGE.**



**ACCURACY YOU CAN TRUST**

**SEND FOR**—The new 1948 Woodworth Gage Catalog just off the presses. Requests for copies must be written on company letterheads.

★ There's a Woodworth representative near to serve you. Write us for his name.

## WOODWORTH

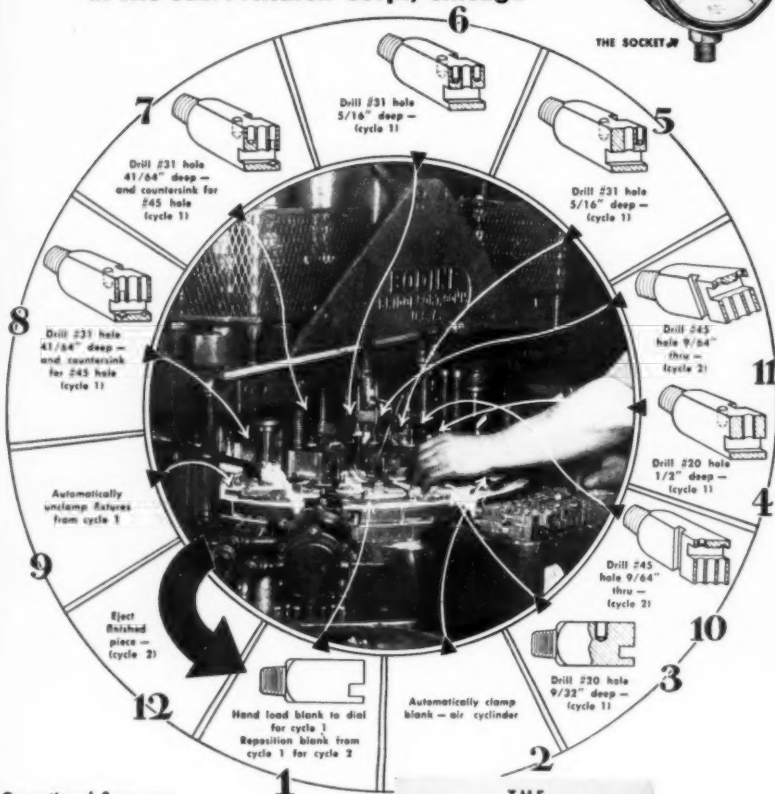
**N. A. WOODWORTH CO., 1300 EAST NINE MILE ROAD • DETROIT 20, MICHIGAN**  
**COMPLETE LINE OF PRECISION GAGES • DIAPHRAGM CHUCKS • CONE-LOK JIGS**

When Writing Advertisers Please Mention **MACHINE** and **TOOL BLUE BOOK**

117

# Bodine...CASE HISTORY No. 19

Processing a Brass Gauge Socket  
at the Jas. P. Marsh Corp., Chicago



## Operational Sequence:

This Bodine set-up employs 8 spindles. The part is repositioned in the dial for a second pass (cycle 2) under the spindles to complete all operations.

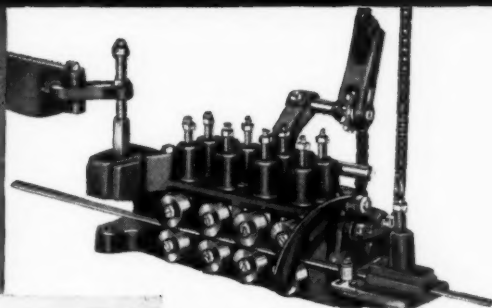
## Production:

One piece is completed per stroke of the machine, 700 pieces per 50 minute hour . . . a total of 5600 operations. Maybe YOU can use a Bodine to reduce production costs.

THE  
**Bodine**  
CORPORATION  
BRIDGEPORT, CT. CONNECTICUT

AUTOMATIC MILD STEEL DRILLING, MILLING,  
TAPPING AND SCREW INSERTING MACHINES

# **WITTEK** *Automatic* ROLL FEEDS AND REEL STANDS *For All Types of Punch Presses*



## **Assures Fast and Accurate Feeding of Coiled Strip Stock**

Wittek Automatic Roll Feeds provide maximum efficiency in the high speed automatic feeding of all types of coiled strip stock to punch presses. Highly flexible in function and application, they are capable of feeding lengths up to 24" per stroke of the press and will handle various stock thicknesses in widths up to the maximum width of the rollers.

Wittek Adjustable Reel Stands provide automatically expanding coil holders that center the coil and assure maximum production by eliminating looping, tangling and back lash of stock. If your production problem involves feeding coiled stock to punch presses, consult us. Your inquiry will be given immediate attention. Ask for completely descriptive catalog.

### **WITTEK** Manufacturing Co.

4305-15 W. 24th Place, Chicago 23, Illinois

*Automatic*  
**ROLL FEEDS  
AND  
REEL STANDS**



# At Last! A SELF-ALIGNING FLANGED BALL BEARING *by* **H E I M**



Self Aligning Ball Bearing Pillow Block



Flanged Pillow Block — Self Aligning Ball Bearing Type

Stock items are illustrated but applications and installation possibilities are unlimited. Here is an inexpensive, self contained ball bearing which aligns itself with the shaft to correct errors in machining or assembly, and which can be mounted simply by pressing it into the hole prepared for it.

Please write for special bulletin on the self aligning bearing

Heim also makes:  
Unibal Spherical Bearings  
Rod Ends,  
Die Polishing Machines  
Roller Bearings



Flanged Ball Bearing Self Aligning



Self Aligning Ball Bearing Pillow Block — Cast Iron Body

**THE HEIM**  
FAIRFIELD



**COMPANY**  
CONNECTICUT

# KNOCK OUT MORE PRODUCTION WITH "KNOCK-OUT" TOOLS!

KNOCK-OUT



## 1. Knock-Out

### REAMER DRIVES

Ream, hone, burnish, lap, etc. Has two-jaw universal chuck (1-5/8") K-O Keyless Drill Chuck (5/8"). Two models—40-1 and 20-1 gear ratio; speeds 20-120 R. P. M. Speed reducer unit may be purchased separately.

## 2. Knock-Out

### KEYLESS DRILL CHUCKS

No more drills ruined by slipping! This fast-positive-self-energising chuck tightens in proportion to work load. Releases with finger-tip pressure. Ideal for production or tool room. Five sizes, 0 to 7/8" capacity.

## 3. Knock-Out

### WHEEL DRESSERS

Scrubbing action of this abrasive wheel dresser does better job with minimum material removed. Ruggedly built with hardened hub and adjustable centers—wheels simple and inexpensive to replace. Four sizes.

## 4. Knock-Out

### EXPANDING MANDRELS

One-piece expanding sleeve holds firmly, accurately, on milling, turning, grinding operations. Quicker, easier to use; five mandrels cover 3/8" to 2-1/2". Other sizes up to 5 1/2".

## 5. Knock-Out

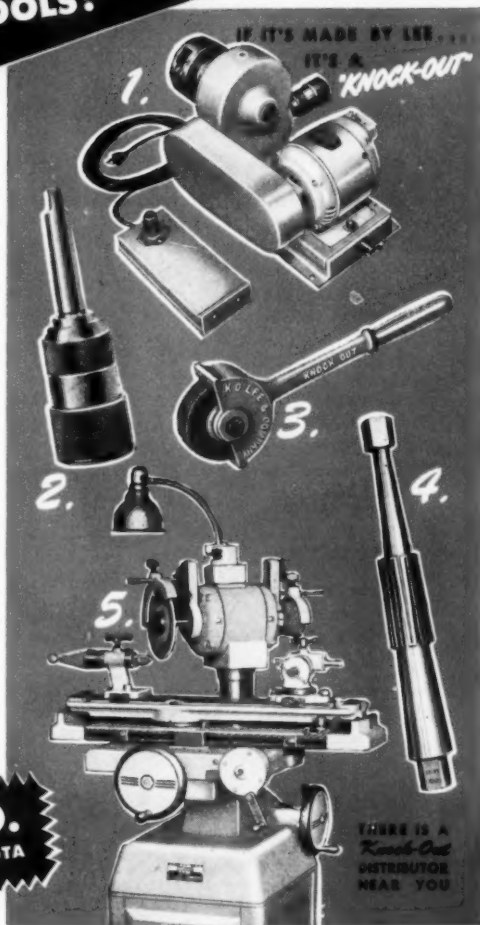
### UNIVERSAL TOOL GRINDER

Universal grinders, carbide grinders, and chip-breaker grinders. Models and sizes to fit every shop, large and small. Simple to operate, accurate, ruggedly built for long service.

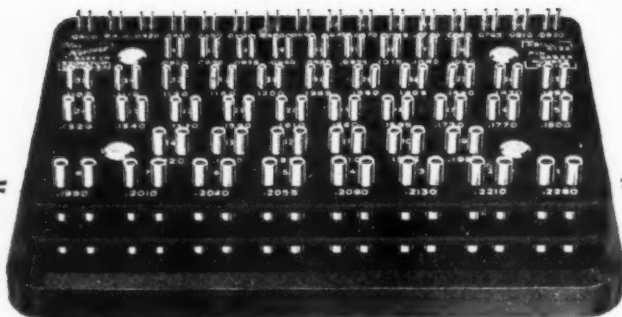
See Your Nearest Mill Dealer  
or Write to

**K.O. LEE CO.**  
ABERDEEN, SOUTH DAKOTA

IF IT'S MADE BY LEE...  
IT'S A  
"KNOCK-OUT"



THERE IS A  
"Knock-Out"  
DISTRIBUTOR  
NEAR YOU



# DRILL SIZE PIN GAGES

## Class Z Accuracy

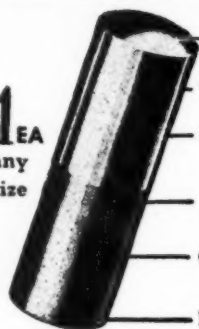
**LETTER SET**—52 gages in 26 pairs from A to Z. \$45 set.

**FRACTION SET**—60 gages in 30 pairs in steps of 1/64" from 3/64" to 1/2". \$50 set.

**NUMBER SET**—120 gages in 60 pairs from 1 to 60. \$90 set.

All sets include stands ... Prices F.O.B. Bridgeport, Conn.

\$1<sup>EA</sup>  
any  
size



- Polished Radius Top
- TOLERANCE  $+.0001$   $-.0000$
- Overall Length  $1\frac{1}{2}"$
- LOWER HALF CONCENTRIC TAPERED for easy insertion
- Oil Hardened Tool Steel
- Flat Ground Bottom

Sets in pairs of gages for checking any number of similar holes. Stands have 3 plates and cover so that gages stand upright. Drill size is plainly stamped in front of each gage hole, together with decimal equivalent to the ten thousandth of an inch.

## IMMEDIATE DELIVERY — 116 SIZES

Check or M.O. should include .08c postage for quantities less than Set. Sets shipped Express Collect. No C.O.D.'s.

THE *Horberg* GAGE COMPANY

19 STAPLES STREET, BRIDGEPORT 1, CONN.



**In actual use**

## **KELLER CARBIDE BURS** **give up to** **7500% more service**

Careful records kept by users themselves prove that P&W Keller Carbide Burs outlast even high speed steel as much as 75 to 1. Here's why:

**TRUE RUNNING**—Keller Carbide Burs are machine ground from the solid. This assures uniform flute spacing and flute depth... makes each bur identical... results in far smoother operation... greatly reduces "chipping out" tendencies. Only machine ground accuracy will give "true running" results. Hand ground burs can only approximate them.

**NO BREAKAGE AT SHANK**—A special method of joining the carbide bur body to the steel shank prevents breakage at this point. This involves not only the brazing method, but the design of the joint.

**WET GRINDING**—Pratt & Whitney Keller Burs are machine ground under a stream of coolant which prevents surface cracks caused by overheating when dry ground. This also permits use of finer grinding wheels giving a smoother finish.

*Write for "Burology," the story of the science of burring, and the P&W Bur Catalog.*

**PRATT & WHITNEY**

Division NILES-BEMENT-POND COMPANY  
KELLERFLEX SALES DEPARTMENT

**WEST HARTFORD 1, CONN.**





**READY FOR YOU!**

## **NEW BULLETIN**

**with illustrations and  
factual data on**

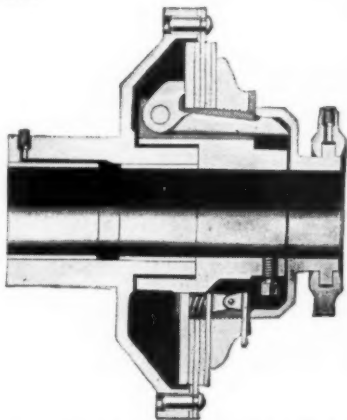
## **CONWAY CLUTCHES**

### ***WRITE for YOUR PERSONAL COPY***

It belongs in your engineering files for data on the 1948 developments in quality clutches.

- PRECISION BUILT OF  
BASIC MATERIALS  
Steel, iron, bronze,  
asbestos, etc.
- INTERCHANGEABLE,  
STANDARDIZED PARTS
- BASIC DESIGNS AND  
ENGINEERING
- QUICK DELIVERIES ON  
CATALOG MODELS

**PATENTED IN U.S.A.  
AND CANADA**



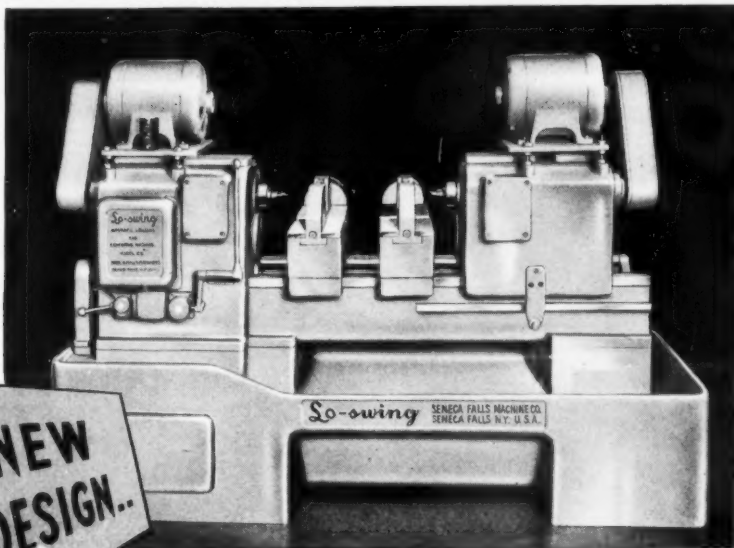
Phantom view of Conway Disc Clutch

# **THE CONWAY CLUTCH CO.**

**2745 Colerain Ave., Cincinnati 25, Ohio**

# MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK



## Lo-swing AUTOMATIC DRILLING & CENTERING MACHINE DESIGNED FOR EITHER LONG OR SHORT-RUN JOBS

● Since its introduction at the Machine Tool Show, the Lo-swing Model "CS" Automatic Drilling and Centering Machine has demonstrated its versatility as an economical producer on both mass production and short-run jobs. Because of its quick change-over features, speeds and feeds are quickly changed and its built-in, adjustable rapid traverse mechanism reduces automatic cycle time to a strict minimum.

Two independent, motor-driven heads permit operation at correct spindle speeds for each head when different sized drills or combination countersinks are used. The drilling spindles are cam operated and positive in action. The cams will operate for any depth of cut within the capacity of the machine and do not require changing. The rapid traverse mechanism for both centering

heads is controlled by cams which are pre-set to a graduated dial, doing away with inefficient "set and try" methods.

Standard, quick-acting, equalizing, air operated vises are available and may be arranged to operate singly or in pairs. Ample distance from the bed to the spindle provides sufficient room for special work-holding fixtures which are available as extra equipment. Electric motors are the standard foot mounting type and may be furnished in sizes from 1 to 3 H.P.

The Model "CS" Automatic Centering Machine is manufactured in four standard sizes, 18", 42", 66" and 90" between drills. Seneca Falls engineers will welcome an opportunity to assist in the solution of your centering problems. Write for full information on this new cost-cutting equipment.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

## PRODUCTION COSTS ARE LOWER WITH Lo-swing

# How We Beat Rising Costs by Changing to Welded Design

By Francis M. Wick, General Manager  
Silver Manufacturing Company, Salem, Ohio

**D**ESPITE the fact that costs have greatly increased in the past two years, the material costs of our "Ohio" Feed Cutter (Fig. 1) are no more today than on V-J day, due to the savings we have gained by changing to welded steel design.

The change to welded steel has also cut the machine's weight 24%, from 455 to 345 pounds—really a price decrease, since most of our sales are to foreign customers who pay duties assessed on basis of weight.

We originally started experimenting with welded steel design because of the difficulty of getting a regular flow of parts. Our welding department has not only eliminated production bottlenecks, but has enabled us to increase production 79% with only a 20% increase in employees. The chief reason for this is that the parts of welded steel require much less machining, grinding and fitting than the former material. The same man-hours we formerly put into finishing now are used to prepare raw materials for the welding department and handle all finishing.

An example of cost reductions on the individual parts is the hood (Fig. 2). The hood made by the former method cost \$1.99. We now fabricate it from three pieces of 12-gauge mild steel, flame-cut and brake-formed, for 94.3 cents, a saving of 52½%. Weight is also cut in half, from 17 to 8.5 pounds.

One of the interesting changeovers to welded design is the corrugated roll and shaft (Fig. 3). Weight was reduced from 18½ to 11 pounds. The corrugated roll is now made of twelve angles, ½" x 1" x ¾". Six of them at a time are inserted in a special jig and tack-welded together to form a half cylinder. The end discs, stamped from 12-gauge sheets, are slipped over the shaft and held in position for welding in a cradle-type jig. Then, using another special jig, the two corrugated halves are



Fig. 1. The "Ohio" Feed Cutter.



Fig. 3. At left is former corrugated roll. New welded roll and shaft (center) are fabricated from steel shapes as shown.

tack-welded to the discs. Tack welds give sufficient strength.

Welding the shaft and roll as an integral unit eliminates the man-hours formerly spent in machining and broaching keyways—a troublesome job.

In redesigning the flywheel (Fig. 4), weight was removed from the center, where it has a low moment of inertia, and concentrated on the rim, where it has the best effect. Thus the welded steel flywheel weighing 56 pounds has the same efficiency as the former design of 72 pounds.

The flywheel O.D. is 24". The rim is a 2" x 1¼" mild steel bar approximately 6' long which is heated, rolled and welded. Spokes are ½" x 2½" bars, drilled and broached at the center to match the hub of cold drawn tubing spaced between them. Welding is done in a jig which has a center post to hold the spokes and tubing in alignment, and three jaws which center the rim around the spokes. Each spoke is welded to the rim with a single pass, and two large tack welds join the hub to the spokes.

Other parts we have converted to welded design are the side plates, pulleys and smooth roll. The frame, formerly bolted, is now welded. All welding is done with "Fleetweld 7" electrode.



Fig. 2. Welded steel hood (center) costs 52% less than former design (left). How welded hood is made is shown at right.

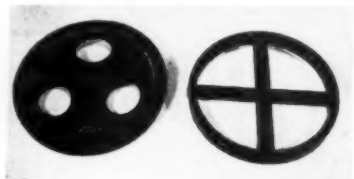


Fig. 4. The old flywheel was replaced by welded design (right) which weighs 23% less, but is just as efficient.

The above is published by LINCOLN ELECTRIC in the interests of progress. Machine Design Studies are available to engineers and designers. Write The Lincoln Electric Company, Dept. 317, Cleveland 1, Ohio.

# Featured in ... this issue . . . . .

**CARBIDE SHEET METAL DIES**, by Earle Glen. Complete assemblies of carbide sheet metal dies and punches can be and are being produced by regular die manufacturers. Mr. Glen discusses the difference between steel and carbide die design, design factors applying to blanking, piercing and notching dies and the use of carbide punches. Page.....133

**FACTORS WHICH INFLUENCE SURFACE QUALITY OF ZINC BASE DIE CASTINGS**, by A. W. Sundwick. Proper design of cavity and correct location of runners, gates and overflows may be present, but if pressure is not correctly applied with respect to time or amount, chills, splashes, gate holes and cold laps may result. Causes of defects and remedies for them are discussed. Page.....143

**ROTO-FINISHING . . . METHOD FOR PROCESSING METALS**, by C. H. Castle. Materials, compounds and equipment for deburring, polishing, britehoning and coloring metals by the Roto-Finishing method. Page .....158

**LETTER FROM ENGLAND**. Page.....169

**ASTE'S PRESIDENT STRESSES BETTER HUMAN RELATIONS**. Increasing importance of "humanics" in industry and how tool engineers can promote better human relations because of their strategic position halfway between management and labor. Page....174

**A.S.T.E. HOLDS SEMI-ANNUAL CONVENTION IN BOSTON**. Tool engineers, production executives and other engineers listened to technical papers and caught up on latest metalworking developments. Page.....175

**SALIENT FEATURES OF HANDWHEEL DESIGN**, by H. F. Williams. In this first

of a series of four articles, Mr. Williams lists the ten questions which are the basis for his series and which he thinks an engineer should answer before choosing a handwheel design; and goes on to discuss factors influencing handwheel design, rim designs and positive grip handwheel rims. Page.....178

**TOOL AND DIE MANUFACTURERS MEET**. Second National Membership Convention of National Tool & Die Manufacturers Association features speeches and technical meetings covering a 3-day session. Page.....192

**PRECISION MEASUREMENT**, by Warren Baker. This is the final in the series which has run in the BLUE BOOK for over a year, and is concerned with measurement by means of fringes, which are the dark bands that show in optical flat measurements. Page.....198

**INSTALLING OLD TYPE LATHE IN MODERN SHOP**, by Lyle Bryant. How to install an old type lathe in a modern shop without installing overhead countershaft and motor support system. Page.....308

**WHAT'S NEW IN METALWORKING**. Page .....211  
**THIS MONTH'S INDUSTRIAL FILMS**. Page .....292

**NEW TECHNICAL BOOKS**. Page.....295

**AVAILABLE LITERATURE**. Page.....301

**SHOP HINTS**. Page.....308

**MECHANICS THROUGH THE AGES**. Page .....340

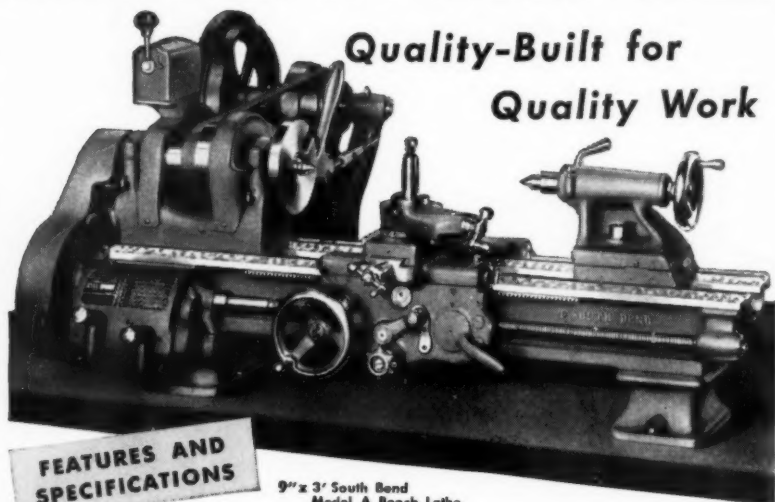
**PRODUCTS INDEX**. Page.....342

**INDEX TO ADVERTISERS**. Page.....350

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

# South Bend 9" Precision Lathes

Quality-Built for  
Quality Work



9" x 3' South Bend  
Model A Bench Lathe

## FEATURES AND SPECIFICATIONS

**SWINGS**—9¼" over bed and saddleswings

**BED LENGTHS**—3, 3½, 4 and 4½ feet

**DISTANCE BETWEEN CENTERS**—  
16 to 34 inches

### SPINDLE SPEEDS—

Six—41 to 658 r. p. m.

Twelve—41 to 1270 r. p. m.

Sixteen—46 to 1176 r. p. m.

### POWER LONGITUDINAL FEEDS—

Model A Lathes—48, .0015" to .0853"

Model B Lathes—26, .0021" to .0155"

Model C Lathes—14, .0021" to .0158"

### POWER CROSS FEEDS—

Model A Lathes—48, .0004" to .0252"

Model B Lathes—23, .001" to .0046"

### THREAD CUTTING RANGE—

Model A Lathes—48 pitches,  
4 to 224 per inch

Models B and C Lathes—45 pitches,  
4 to 160 per inch

**MAXIMUM COLLET CAPACITY**—½ inch

The quality that is built into South Bend 9" Precision Lathes enables them to produce quality work with efficiency under all conditions. Regardless of the type of machining—between-centers, collet, fixture, or chucking—close tolerances can be maintained and a maximum volume of fine work produced with a minimum of effort.

Write for Catalog 9-J which fully describes and illustrates all South Bend 9" Precision Lathes and attachments.

### SPEED PRODUCTION WITH THESE ATTACHMENTS

COLLET ATTACHMENTS

TAPER ATTACHMENT

MILLING ATTACHMENT

ELECTRIC GRINDER

CARRIAGE STOPS

HANDLEVER BED TURRET

DOUBLE TOOL CROSS SLIDE

SQUARE TURRET

CENTER REST

FOLLOWER REST



BUILDING BETTER LATHES SINCE 1906  
**SOUTH BEND LATHE WORKS**  
426 EAST MADISON STREET • SOUTH BEND 22, INDIANA

# *As the* **editor** *... SEES IT ...*

## **YESTERDAY A TOOL MAKER—TODAY AN ENGINEER**

A machine is no better than the amount of time and intelligence expended on the tooling connected with its operation. If accelerated production schedules are to be met and prices to be reduced by increasing the output per man hour, the tool engineer will bear his share. It will be of advantage to management to expend time and effort to develop tool engineers in their own plant. Even modern machines are efficient only in the proportion that tooling is efficient.

The responsibilities of today's tool engineer have changed as drastically from those of the old time toolmaker, as the appearance of today's plants differs from those of yore. A tool engineer's duty used to end with the building of a fixture, or a gadget, as some people called them. Now, however, he is such a definite part of management that his counsel is sought on diverse matters ranging from production to industrial relations and other categories unrelated to the business of toolmaking.

His responsibilities have grown to management proportions—he must increase production through efficient

tooling, assist in the purchase of equipment needed to meet production problems, assist in planning the flow of production and supervise economic tooling for reduction of manufacturing costs.

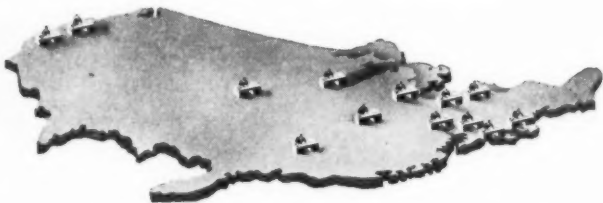
It is no longer essential for the tool engineer merely to design a fixture for a machine, he must know what type of machine will best perform a given operation; he must be acquainted with the overall production problems of the plant so that idle machine time is prevented; he must know the production values of every machine in the plant so that a given piece of work will flow through the plant as easily as paste out of a tube. And if there is no suitable machine available, he must build one.

Along these lines it is of interest to note that at the recent meeting of the American Society of Tool Engineers, an afternoon session was devoted to the subject of welding, proof that tool engineering requires diversified knowledge of methods and materials besides an ability to build intriguing mechanical devices.

*William F. Schleicher*  
**Editor**

## A BUYING GUIDE FOR ABRASIVES

### POINT No. 11



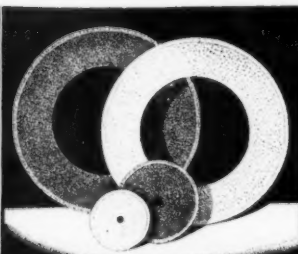
### District Representation

Certain buyers of abrasives find the measure of their sources of supply in the local representatives of abrasive manufacturers. Therefore, it is a matter of great satisfaction to us to have men of ingenuity and experience representing us in key locations throughout the country. It is by means of our district organization that users are given direct access to the engineering, research, and wide scale technical activities of The Carborundum Company. It is their intelligent handling of abrasive problems, and their sincerity in serving customers' needs that makes every user think first of CARBORUNDUM, when they think of abrasives. The Carborundum Company, Niagara Falls, New York.

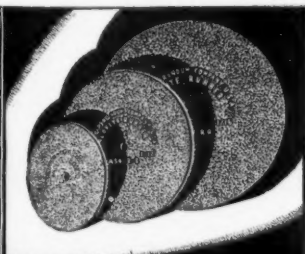


"CARBORUNDUM" IS A REGISTERED TRADEMARK WHICH INDICATES  
MANUFACTURE BY THE CARBORUNDUM COMPANY

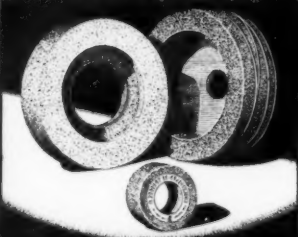
**A Good Rule for Good Grinding**



Specialized wheels by CARBORUNDUM  
for thread grinding.



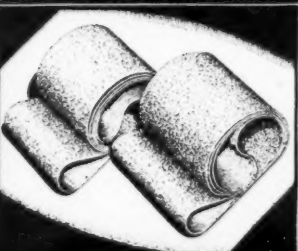
Cutting-off wheels... the modern tool  
for faster, less costly, more finished cuts.



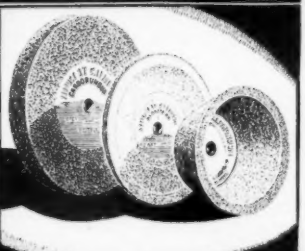
Cool-cutting green grit wheels for  
cemented carbide.



Diamond wheels to meet stiffer  
technical needs.



A coated abrasive for every  
sanding and finishing condition.



All standard shapes are supplied in  
grinding wheels by CARBORUNDUM.

... CALL IN

# CARBORUNDUM

TRADE MARK

● BONDED ABRASIVES ● COATED ABRASIVES ● ABRASIVE GRAINS AND COMPOUNDS

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK



## "KEY PEOPLE"—When You Need Steel

Ryerson's function is not only to supply your steel, but to deliver it on time. From the moment the Ryerson switch-board flashes your incoming call until the steel is laid down in your plant, a corps of helpful, intelligent employees well-trained in the Ryerson "Immediate Steel" tradition are at your service.

The likeable young women at the switch-board, phone-order salesmen, dispatchers, crane operators, skilled warehousemen who cut, shear and shape stock sizes to fit your specification, truck drivers—all of them are key people at Ryerson—key people in your service, when you need steel!

In spite of shortages, we are putting forth every effort to serve all industry to the best of our ability. Naturally, many sizes

and certain products are out of stock. However, for the most part you can depend on Ryerson for immediate shipment of a wide range of steel products.

### JOSEPH T. RYERSON & SON, INC.

Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles.

#### PRINCIPAL PRODUCTS

Bars—alloy steel	Allegheny stainless —
reinforcing	sheets, plates, shapes,
hot and cold rolled	bars, tubing, etc.
Structurals	Plates —
Mechanical Tubing	Inland 4-way Floor
Boiler Tubes, Fittings	Plate
Tool Steel	Wire, Chain, Bolts,
Sheets and Strip Steel	Rivets, Gabbitt
Metal Working Tools & Machinery, etc.	

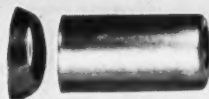
# RYERSON STEEL

# CARBIDE SHEET



# METAL

# Dies



**by Earle Glen, Carbide Die Engineer,  
Carboloy Company**

Considerable attention has been given in the last few years to the development of carbide dies. The author discusses some of the principles underlying the design of carbide dies. Attention is paid to the subject of punches.

In general there are few important differences between dimensional designs of carbide and steel dies. However, the Carboloy Company recommends, in cases where the job is an entirely new one and a large die investment is involved, to make a try-out die of steel and then duplicate this in carbide. This permits modifying the original design before the carbide die (with its extremely long life—20 or more times that of steel) is produced.

Complete assemblies of carbide sheet metal dies and punches can be and are being produced by regular die manufacturers. Carbide nibs, sections, etc., for such dies are being delivered to the die manufacturer in hardened form, for finish grinding.

In draw dies, aside from long life, carbide dies are showing generally improved finish on the parts produced while blanking dies maintain freedom from burrs over extremely long runs. Users report fewer rejects, closer main-

tenance of tolerances, and generally lowered sheet metal fabrication costs, with decreased buffing, polishing and grinding, less down time, increased production—and of course, vastly longer die life with a minimum of reconditioning.

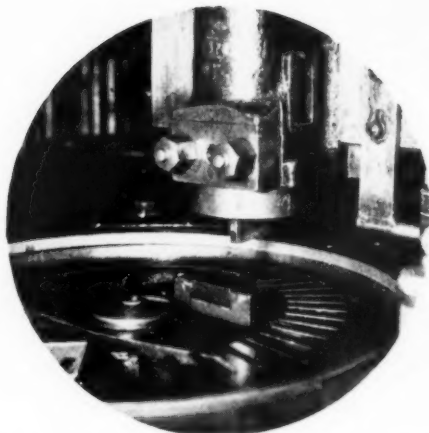
Tables of dimensional limits on carbide die and punch nibs, for the general use of the die manufacturers in ordering carbides are now available. These indicate the amount of stock to be allowed on dies for finishing, both OD and ID, for various sizes of dies and punches. The amount of excess stock generally recommended, ranges from .008 inches up, depending on size.

## DRAW DIE DESIGN

Prime difference between steel dies and carbide from a design standpoint are:

1. Usual practice is to take just a light finishing grind on OD of carbide nib and then grind steel case to fit

• • •  
**Fig. 1—Typical carbide lamination die for electric motors. Up to two million circular laminations have been produced per grind with the carbide dies. Stock is .025 silicon steel. (Good life per grind with steel dies is around 50,000 laminations).**  
 • • •



the nib. Dies must be so designed that ID can be finished by grinding and/or lapping since carbides cannot be machined. This means that segmental construction should be used for irregularly shaped dies.

2. Due to longer life of carbide dies, bearing length—and therefore overall

height of nib—can be made somewhat shorter than for steel dies. Good lengths are  $\frac{1}{8}$ " for dies up to  $\frac{1}{2}$ " ID and up to  $\frac{3}{8}$ " for dies with an ID of 2" or over.

3. Allow liberal back relief on exit side of bearing.

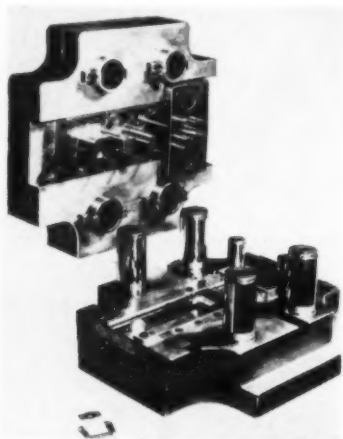
4. OD of nib equals bearing diameter plus from  $\frac{5}{16}$  to  $\frac{3}{4}$ " per side for wall thickness depending on die size. (Where bell openings are large, use bell opening plus  $\frac{3}{8}$  inch on diameter).

5. For irregular shapes, use segmental construction for simplicity in finishing.

6. On the cupping dies make the OD of nib larger than OD of blank to keep all wear producing action on the wear-resistant carbide.

7. For extremely heavy draws—as for 'ironing' steel cups, the steel die case should be at least twice the OD of the nib.

8. On re-draw dies, where cup is



• • •  
**Fig. 2—Another motor lamination die—this one of 5 stage progressive rather than indexing type—for motor rotors and stators.**

bottomed, extend the carbide nib below the bottom of the cup to provide a wear resistant lead for the knock-out.

9. If carbide nib and case are to be ground after assembly, relieve the case below the nib prior to assembly so that grinding wheel will not touch the steel when grinding the carbide.

10. For shrink fit dies, use SAE 4340 hardened to Rockwell C 38-42

11. Carbide draw die nibs are usually assembled in cases by shrink and press fitting in the normal manner. (For segmental dies use shrink fit). Shrink allowances run from .0015 to .009" for dies from 1/2" to 6" ID. Press fits follow customary practice on steel.

12. In progressive dies, nibs should be finished complete to size before assembling. (Use locating fixture for assembling).

13. Use mechanical strippers with carbide draw dies. Although successfully used in some instances, stripping on the back edge is not generally recommended.

### BLANKING DIES

Experience indicates that carbide blanking dies not only give a life from 20 to 40 times that of steel dies but also produce parts free from burrs due to ability of carbide to hold sharp shearing edge over long runs. Also less stock need be removed to 'sharpen' Carboloy nibs. Prime design factors applying specifically to blanking, piercing and notching dies are:

1. Carbide is generally assembled to back-up shoe by mechanical means. This avoids necessity of brazing, gives solid backing to the carbide and simplifies attaching. Four methods of mechanically attaching nibs to shoes are available.

A. Cap screws through pre-formed, countersunk holes in the carbide.

B. "Through" hole in the carbide to accommodate a tapped

section inserted by die manufacturer. These are anchored to prevent rotation.

C. Use of machineable inserts in performed blind or through holes in the carbide. Drilling and tapping is by die manufacturer—to location; inserts are imbedded by manufacturer.

D. Clamping the carbide to the shoe by using a steel ring fitting against a shoulder on the OD of the carbide nib. Shoulder should be approximately 1/8" wide by approximately 1/4" high.

2. Special carbide grades are used for blanking dies. These grades have been

• • •

**Fig. 3 — Combination die on which 8,000,000 radio tube parts were punched, drawn and trimmed (stainless steel — 30% chrome) without reworking dies once during the entire run.**



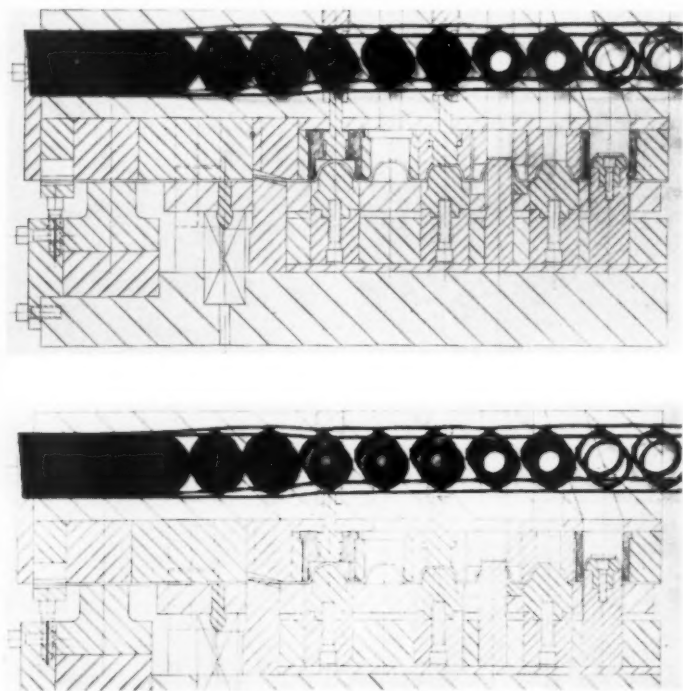
specially developed for impact work of this nature, and are quite different from carbide grades used for cutting tools, for instance.

3. Wall thickness needed for blanking dies depends on size of holes or inserts used. Minimum wall thickness is  $5/16"$ , which corresponds to an insert size accommodating a No. 5 machine screw.

For larger size inserts, correspondingly more stock has to be allowed around the insert. For  $3/4"$  stud or screw, minimum wall thickness would be  $1-11/16"$ , which allows  $1/4"$  of stock around the insert. Usually it is better practice to use a large number of smaller inserts rather than one or two big ones.

4. Blanking dies may also be assembled if convenient by press fitting

Fig 4—Nine station die block using carbide nibs and sections in the fifth and 10th station (first forming and cut-out dies). Part is tie-rod bearing. In service one year during which carbide stations produced 5,000,000 draws without maintenance and cut-out die 2,000,000 operations for each re-sharpening. (Former steel cut-out dies had to be re-sharpened once every 200,000 pieces, were scrapped after 3 sharpenings.)

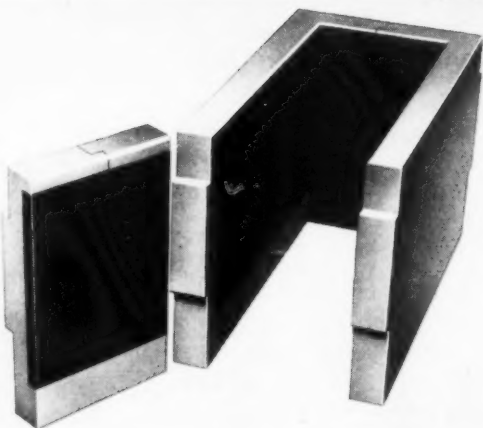




• • •

**Fig. 8.** Carbide liners are being used effectively for compacting and molding dies. Shown here is part of a mold for forming abrasive materials into bricks. A new method of assembling the carbide liners to the steel case with screws or studs has materially reduced costs of manufacturing large carbide dies and molds of this nature.

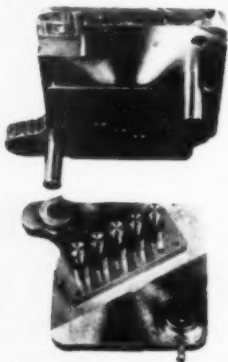
• • •



an adequately long die life to permit retention of steel in those places, using carbides primarily where maximum wear occurs.

• • •

**Fig. 7.** Carbide dies are also being used to reduce costs for other materials than sheet metal. This multiple hole die is used for blanking 28 mm. linen paper for bottle caps.



11. Care should be taken, however, that design of all other parts aside from carbide nibs should be such as not to wear out before the carbide.

12. Nibs should be husky enough, in progressive dies, to allow rigid attachment and have plenty of stock for re-grinding, where extremely long runs are involved.

## PUNCHES

Use of carbide punches is developing rapidly, since with carbide dies the punch now frequently wears out before the die. Nevertheless there are still many cases where steel punches can be used effectively with carbide dies—particularly in drawing work. As for dies, life expectancy is 20 or more times than that for steel punches. In general, use carbide wherever wear may be expected on the punches. Following are some of the considerations which differentiate carbide from steel punches as to design, etc.:

1. Shearing edges should not be honed or touched up with a stone. Leave them sharp. They hold their

**Save PLANER  
and SHAPER Time  
With this  
STARRETT  
Precision  
Gage**

operators can make every first cut "on the  
edge" by setting planer and shaper tools  
with Starrett No. 599 Planer and Shaper  
Gage. Used with a micrometer or Vernier  
caliper, it will gage with extreme accuracy  
within its range of  $\frac{1}{4}$  to  $6\frac{1}{2}$  inches. Also  
serves as a universal height gage and gap  
gage. Alignment and parallelism of ends,  
surfaces and work contacts held to close limits  
of lateral play eliminated by angular slide  
ways. Note handy level.



**AS NECESSARY AS SKILLED MEN**

Leading shops rate STARRETT Vernier Tools high on  
their list of essential shop equipment. STARRETT  
Vernier Caliper No. 122 (shown above) is a sound,  
long-term investment in dependable, uniform accu-  
racy. Sharp, clear-cut, easy-reading graduations;  
perfect workmanship, finish and balance — all  
guaranteed by the STARRETT reputation.



**SYMBOL OF SAFE, SURE ACCURACY**

STARRETT Micrometers are indispensable equipment  
for skilled craftsmen in tool rooms, in the shop, of the  
inspection bench. STARRETT No. 230 shown above  
measures by thousandths up to one inch, can be  
ordered chromium plated for stain resistance, long  
wear, easy reading. More than 300 different models  
and sizes in the complete Starrett line make it easy to  
select the one best micrometer for any job.

*Write for Complete Starrett Catalog No. 26B*

**Buy Through Your Distributor**

**THE L. S. STARRETT CO. • ATHOL, MASSACHUSETTS • U. S. A.**

*World's Greatest Toolmakers*

# STARRETT

**PRECISION TOOLS • DIAL INDICATORS • STEEL TAPES • GROUND FLAT STOCK  
HACKSAWS • BAND SAWS FOR CUTTING METAL, WOOD, PLASTICS**

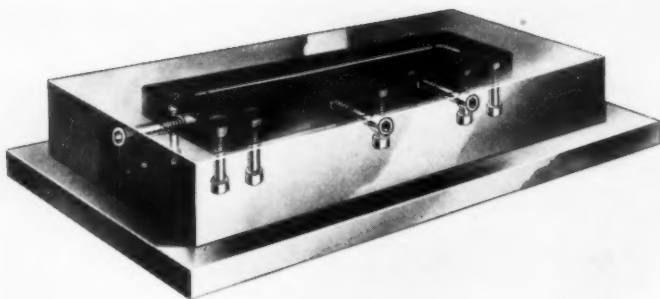


Fig. 9—Draw and blanking dies for irregular sections may be readily produced by making the carbide inserts in sections and attaching them with screws or studs as shown here. Machineable inserts are imbedded in the carbide before delivery to die manufacturer. Die manufacturer then drills and taps these inserts.

edge when the correct grade of carbide is employed.

2. Carbide punches can be made with attached carbide sections or made of solid carbide (for smaller punches this is more economical usually).

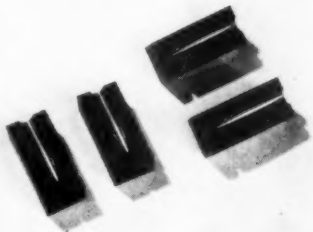
3. Mechanical attachment methods (as mentioned under blanking dies) are recommended for carbide punches, wherever possible.

4. Where long slender solid carbide punches are used, it is good practice to guide the punch in a bushing (standard bushings are readily available).

5. Make carbide section of ample length to cover all points of wear.

6. For light draw work, carbide punches may be assembled by brazing.

Fig. 10—Typical carbide swaging die. This is made of solid Carboloy cemented carbide.



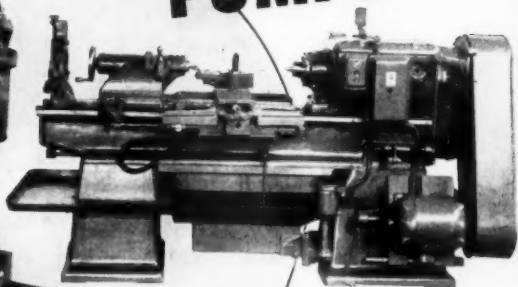
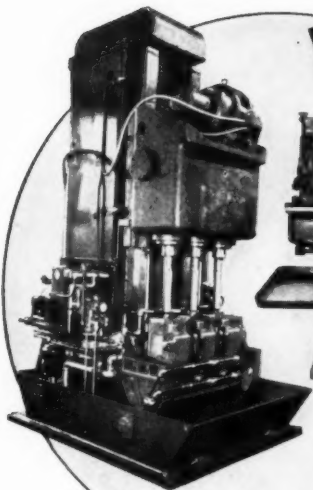
#### ISLAND EQUIPMENT CHAIN CONVEYOR

16-page, 2-color bulletin on Ultimate Double-Flex Chain Conveyor for economical handling of cases, cartons, boxes and cans. Illustrated with diagrams, floor plans, layouts, installation views and detailed construction of the system. Obtainable from The Island Equipment Corp., Dept. BB, 101 Park Ave., N. Y. 17, N. Y., on company stationery.

#### GAERTNER PRECISION INSTRUMENTS

Contains list of standard products and services grouped according to their basic uses. Groupings are as follows: Linear, Coordinate, Angular, Spectral, Polarized Light, Photometric, Optical Test, and Time Measurements, Optical Parts, and Special Services. Generously illustrated, 8 pages. The Gaertner Scientific Corp., 1201 Wrightwood Ave., Chicago 14, Ill.

# RUTHMAN PUMPS



help you get  
**GREATER EFFICIENCY**  
on your machines

To the right is a 16" Lodge & Shipley Selective Head Engine Lathe equipped with a Model 2-P3 Long, 1/10 HP Gusher Coolant Pump.

To the left is a Baush Three-Spindle Vertical Boring Machine equipped with a Model 11025 Ruthman Gusher Coolant Pump.

Oversized pre-lubricated bearings requiring no further lubrication, electronically balanced, one-piece rigid shaft, no metal-to-metal contact gives greater efficiency in Ruthman Gusher Coolant Pumps. You are sure of years of trouble-free service at low maintenance cost when you specify Ruthman Gusher Coolant Pumps on your metal-cutting machinery.

Write for Catalog 10-G

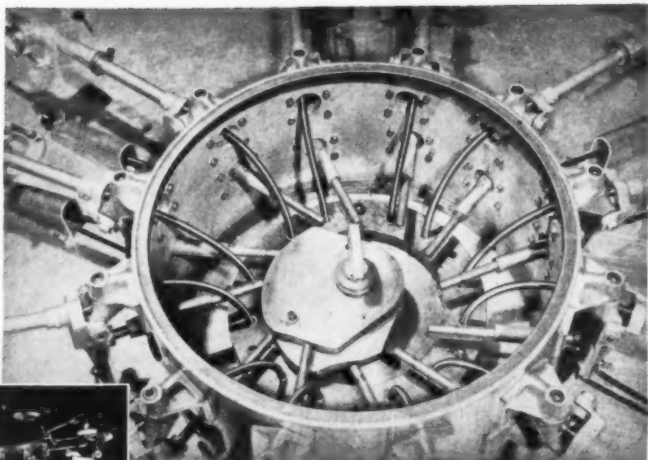
## THE RUTHMAN MACHINERY CO.

1816 READING ROAD

CINCINNATI 2, OHIO



Photos  
Courtesy of  
Ryckman  
Machine Co.,  
Hamilton,  
Ontario



## *An eye-opener - ON THE USE AND VALUE OF S.S. White Flexible Shafts*

This Ryckman Lining Machine which rolls a gold or silver edging on dinnerware has 6 stations. Table and central dome, revolving at a desired production speed, carry a workholder and two applicator heads for each station. Arms carrying the heads are pivot-mounted so that heads can be raised for work changes, and can ride up-and-down on scalloped or irregular ware. Arms are also adjustable in-and-out for different size plates.

A rotary drive is needed for each applicator head that (1) permits up-and-down and in-and-out movements of arms (2) provides a steady drive while heads ride up and down (3) is practically free from torsional vibration.

Ryckman engineers say: "We find S.S. White flexible shafts well suited to this job. We can see no change in shaft characteristics after some 2000 hours of operation."

Look at the illustration. Can you think of a way of making these drives that would be as simple and adjustable? For adjustable drives, S.S. White flexible shafts are in a class by themselves.

**WRITE FOR FLEXIBLE SHAFT  
HANDBOOK — FREE**

Write for it on your business letterhead and mention your position.

# **S.S. WHITE**

THE S. S. WHITE DENTAL MFG. CO.



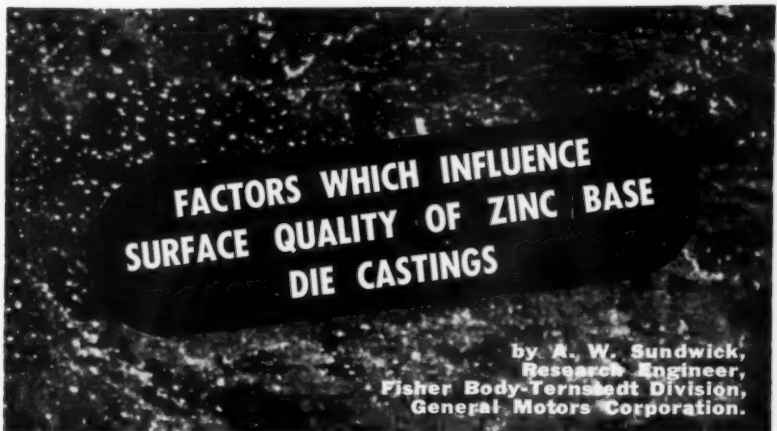
# **INDUSTRIAL**

**DIVISION**

DEPT. H 10 EAST 40th ST., NEW YORK 16, N. Y.

FLEXIBLE SHAFTS • FLEXIBLE SHAFT TOOLS • AIRCRAFT ACCESSORIES  
SMALL CUTTING AND GRINDING TOOLS • SPECIAL FORMULA RUBBERS  
MILKING REVERSERS • PLASTIC SPECIALTIES • CONTRACT PLASTICS MOLDING

*One of America's AAAA Industrial Enterprises*



## FACTORS WHICH INFLUENCE SURFACE QUALITY OF ZINC BASE DIE CASTINGS

by A. W. Sundwick,  
Research Engineer,  
Fisher Body-Ternstedt Division,  
General Motors Corporation.

The quality of the surface of zinc base die castings is influenced by the quality of the zinc alloy used, the design of the die, and the construction and maintenance of the casting machine. Very frequently, the effort to determine the cause of specific troublesome surface defects on die castings resolves into a debate between those who feel that the metal itself is at fault and those who feel that the trouble is caused by faulty die design.

In an effort to determine the reasons for poor surface quality, a number of zinc alloy die castings, which showed various surface imperfections, were studied in relation to the size, shape and location of their gates and runners. All of the castings examined were reasonably of the same composition, that is, within the specification limits for ASTM-Alloy XXV., and were cast in the same standard gooseneck-plunger type of die casting machine.

**Many surface defects of die castings stem from the same fundamental cause: lack of enough pressure on the metal to force it solidly against the cavity walls. Splashes, chills, gate holes and cold laps are frequently responsible for poor surface conditions. Reasons for these occurrences and methods of safe guarding against them are discussed.**

Radiographs showed that though there were appreciable differences in the amount and distribution of porosity there was no strict correlation between the amount of porosity in a casting and its surface appearance. In other words, the perfectly solid castings were found to have about the same types and quantity of surface defects as the porous castings.

One of the more common causes for poor surface condition is the "chill". This defect is characterized by its generally shiny appearance which, when examined under suitable magnification, is found to be an area of small cold-laps and holes (Figs. 1 & 2). The

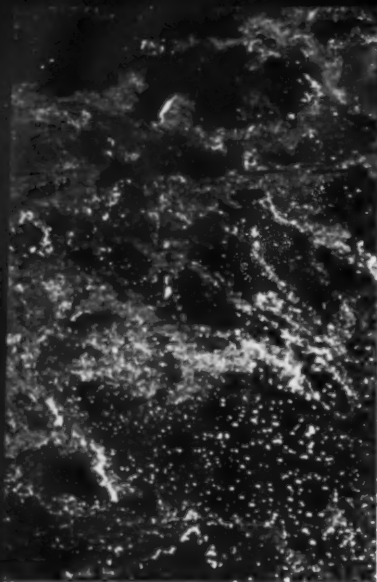


Fig. 1 & 2 show one of the more common causes of poor surface condition is the chill. This defect is characterized by a shiny appearance which turns out to be an area of small cold laps and holes when magnified. This is usually caused by the metal not having been under sufficient pressure to force it into solid contact with the cavity wall while yet plastic enough to perfectly assume the outline of the cavity surface.

indications are that the metal was not under sufficient pressure to force it into solid contact with the cavity wall while yet plastic enough to perfectly assume the outline of the cavity surface. The surface appearance of the casting, that is, was influenced largely by the surface tension of the metal.

A "chill" may occur when the die or the metal is below the optimum operating temperature, when insufficient pressure is applied or when there is a delay in the application of pressure after a cavity is filled or partially filled.

When solidification does not progress uniformly and simultaneously in all parts of the cavity the final pressure will not be transmitted uniformly to all parts of the cavity. For this reason there may be areas of insufficient pressure even when the overall pressure

is greater than would normally be considered necessary or desirable. Logically, an attempt should be made to approach a condition of uniform and simultaneous progress of solidification by proper design of the cavity and the correct location of the runners, gates and overflows, but the shortcomings along this line must be made up for by pressure and this pressure, to be effective, must be applied immediately after filling the cavity. The wall thickness should be as uniform as possible but if there are large differences in cross-section an approach to uniform solidification can be accomplished by placing water-lines near the cavity wall at the heavy section and gating into the thinner section. Very often the arrangement of the cavity in the die block can be made to take advantage

of the sprue and runner to supply extra heat to thin sections. In this way other means of heating the die, for instance with torches or electric heaters, may be dispensed with.

The cause for insufficient pressure, or late application of pressure, may be due to improper functioning of various parts of the hydraulic or mechanical systems but very often it will be found that the trouble lies in high resistance to flow of the metal due to poor design of the runners and gate openings. As far as the die is concerned the pressure losses may be caused by constriction at the sprue, long thin runners, sharp bends in the runner, small gate openings or too long a land at the gate opening. Insufficient or improperly placed air vents will allow excessive back pressure in the cavity to momentarily act against the shot pressure allowing time for solidification to begin before the metal is pressed against the cavity wall.

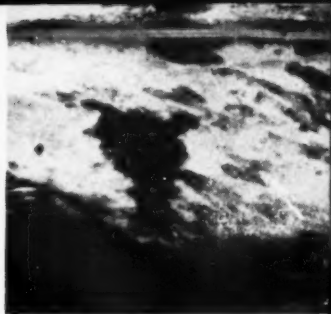
The "chill" may also be due to improper location of the gate opening, causing the metal to flow into a section of the cavity, stop, and partially solidify before the remainder of the cavity is filled and pressure is applied. The die should be gated in such a way that all the metal in the cavity is kept moving until the whole cavity is filled. Any delay between the simple filling of the cavity, or any part of the cavity, and the application of full shot pressure will produce imperfections on the casting surfaces. For this reason it is essential to get uniform filling rates in each cavity of a multiple cavity die since the full shot pressure cannot be applied until all cavities are filled. When the cavities are similar this merely requires exact duplication of the runners and gate openings. Examination of similar parts cast in multiple cavity dies showed that poor surface conditions were most prevalent

when the size of the gate openings and runners were not perfectly matched. However, when the cavities are not similar the problem of gating for uniform filling rates becomes quite complicated. In these cases a very fast shot is sometimes necessary in order to cut down the time delay between the accomplishment of a full cavity and the application of the final maximum pressure which occurs only after all cavities are filled.

Sometimes the design of the cavity is such that the metal must travel a long distance to fill it. The molten metal will naturally cool and become sluggish as it travels and there would be an appreciable pressure drop toward the far end of the cavity. Chills which are caused by such conditions and which persist, even after all steps have been taken to reduce the resistance to flow and shorten the travel, can often be remedied either by placing an overflow or well next to the cavity and close to the affected area or by gating into more than one section of the cavity. However, the latter expedient may give rise to other surface defects, such as "swirls", unless care is taken to place the gates so that all the metal entering the cavity flows in approximately the same direction. That is, if multiple gate openings must be used they should not be placed so that the streams of metal oppose each other.

The more common methods of combatting the tendency to "chill" have been to raise the temperature of the molten metal, operate the die at a higher temperature, and fill the cavity with a very fast shot. Within certain limits these devices may be successful but they shorten the life of the die and contribute to the various causes for machine failure.

Another frequent surface defect is that caused by the splashing of metal particles against the walls of the cav-



**Fig. 3 & 4 show a surface defect caused by the splashing of metal particles against the wall of the cavity. Heavy sections will often show these splashes. Their appearance is similar to that of the chill. This particular specimen is mottled with bright spots of irregular shape and size.**

ity. Heavy sections do not ordinarily "chill" but will very often show these "splashes". The appearance is similar to the chill. In this case the surface is mottled with bright spots of irregular shape and size (Figs. 3 & 4). Of the castings examined, most of those which showed this defect had gate openings which were either very thin or were thinned down at the ends. It is believed that gates of this design tend to spray the metal into the cavity rather than to flow it in in a solid stream. The gate openings should be of uniform depth across their full width and as deep as possible consistent with ease of trimming. In certain shapes of castings the effects of spraying can be eliminated if the gate is directed into one end of the cavity with the gate opening close to that end. This is known as the "back-up" gate. It eliminates spraying because the gate opening is covered by molted metal at the beginning of filling. Care must be taken to locate the gate opening close enough to the end of the cavity so that the metal in this section is kept in motion until the cavity is filled. The location of the gate opening should also be such that the metal is not directed against cores or an opposing wall in such a way as to break up the flow and cause particles to become deflected into various parts

of the cavity ahead of the main stream.

Microscopic examination at the cross-section of some of these splashed particles indicates that they do not knit solidly to the base metal and though a light buffing is usually sufficient to mask the defect to the naked eye, the area will not plate over smoothly when subjected to the usual cleaning and acid etch.

When fine particles of the molten alloy are sprayed into the cavity at high velocities and strike a section of the cavity wall where there is little or no wash by the main stream of metal a surface defect known as "soldering" or "fusing" will occur (Fig. 8). The remedy is to stop the cause for spraying either by increasing the gate opening, by using a slower shot or casting at a lower metal temperature. If these cannot be done the gate location should be changed. Under certain conditions, continued spraying and fusing will attack the die surface to such an extent as to make it necessary to refinish the die.

Perhaps equally as serious a source of die trouble is the "gate-hole" (Fig. 5). This defect, due to porosity at the gate opening, can sometimes be substantially reduced by increasing the

# Nicholson

**sells only through**  
**Industrial Distributors**  
**and**  
**Hardware Wholesalers**

***Here's how this system benefits  
you as an industrial user***

The distributor of industrial tools and supplies performs a very necessary function in the commercial economy of a nation whose industries are huge, varied and located over a vast area.

He performs the double service of *gatherer* and *distributor*.

He scours the earth for the things you need. He examines and studies them; weighs their merit and value; helps determine which brands will serve you best. Thus he becomes expert on selection, application and proper use. He stocks or warehouses countless items—and patiently awaits

your pleasure as to *when* you may want *how much* of what.

He takes over sales, credit, delivery and other services which, if handled by the manufacturer himself, would increase the latter's supplying costs—and consequently your purchasing costs.

Yes, your industrial distributor does these and many more things in both your and the manufacturer's behalf which it would be uneconomical for either to do independently.

The more support he gets—from both manufacturer and user—the more useful he becomes to all concerned. Nicholson believes firmly in this policy.



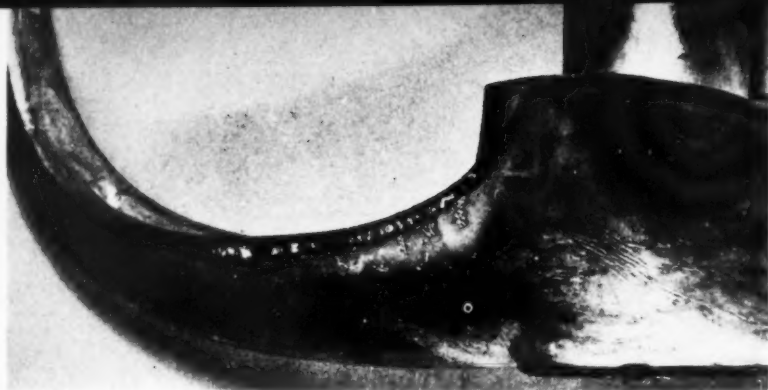
**NICHOLSON FILE CO., 16 Acorn St., Providence 1, R. I.**

*(In Canada, Port Hope, Ont.)*



**NICHOLSON FILES FOR EVERY PURPOSE**

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK



**Fig. 5 shows another type of defect, the gate hole. This is due to the porosity at the gate opening and can be substantially reduced by increasing the pressure on the metal in the cavity.**

• • •

pressure on the metal in the cavity just as suggested for reducing the tendency to "chill". Of several castings with gate-holes which were examined it was found that the runners were very porous. It is believed that excessive turbulence in the runner could be a contributing cause of this porosity. Sharp bends should be blended out and the cross-sectional area of the runner, from the sprue-cutter to the gate opening, should not increase at any point. Preferably it should gradually decrease throughout its length. Turbulence could also be reduced by designing the shot mechanism in such a way as to provide for relatively slow movement of the metal through the extension nozzle, sprue and runners and fast movement at the end of the shot when the cavity is being filled.

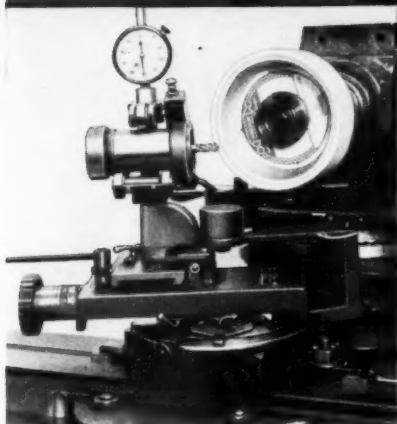
"Cold-laps" will occur when two bodies of metal meet after having cooled to such a degree that it is not possible to make them mix intimately, (Fig. 6). In this case the defect is usually accompanied by "chills". If the "cold-lap" persists after the gates and runners have been opened up it may be necessary to change the location of the gate opening so that the metal will

be caused to flow through the affected area. In cases where the defect occurs close to the parting line an improvement in the condition may be obtained by means of an overflow placed so as to change or increase the flow of metal in the area as well as to locally apply additional heat to the die surface. The die must be sufficiently vented and the vent must be placed so that it leads from the section of the cavity which is last to fill. This position can be determined with fair accuracy by making a regular speed shot with an amount of metal which is somewhat less than that required to completely fill the cavity. The "swirl" (Fig. 7) being essentially a "cold-lap" is corrected in like manner.

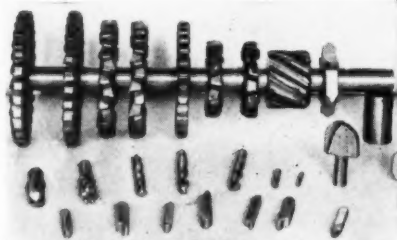
A great many of the surface defects to which die castings are subject stem from the same fundamental cause. That is: lack of enough pressure on the metal to force it solidly against the cavity wall. The difficulty is in appreciating how many factors affect this pressure. Once the die caster realizes these, he can attack his problems in a more logical manner. He must realize that the pressure must be applied while the metal is reasonably fluid otherwise it

# Radiform it the accurate way

## "Trial and Error" Method is Obsolete



PATENT PENDING



Here are a few standard cutting tools that have been ground on the Radiform into special forms.

Radii can now be formed on spiral fluted end mills and similar rotary cutting tools. You will see pictured at the left the Radiform forming a  $3/16"$  convex radius on a  $3/4"$  dia. end mill. This attachment on the Radiform with its 24 station indexing head will save you time and money, and give you precision results you had never hoped for.

The Radiform generates forms on most types of cutting tools. Carbide form tools are no longer difficult to grind with a Radiform.

New, reduced prices for the Radiform have just been released. So write today for revised price list and complete information showing examples of how the Radiform can simplify your complex expensive grinding operations.

A number of good territories are open to qualified distributors.

**W. F. MEYERS COMPANY • ESTABLISHED 1888**  
1010 FOURTEENTH STREET • • • BEDFORD, INDIANA

will not assume the contours of the cavity surface. He must realize that there can be many pressure losses between the gauge on the hydraulic system and the far end of the casting. If these losses can be reduced to a minimum the die caster will often find that he can make good castings even at a lower "apparent" pressure as indicated by the gauge on the accumulator bottle. A great deal of ingenuity is necessary at times to locate the cause of pressure loss. The die is one part of the equipment which can be expected to remain in the same condition for a reasonable length of time and, once corrected, can be excluded from the list of possible trouble sources.

A great many other factors of die design could be mentioned which have an influence on the surface quality of the castings. However, the die designer has been successful in designing rigid dies and locating enough water lines (which may or may not be used, at the discretion of the die caster) so that castings of poor surface quality due to these causes are now relatively few.

The machine, being a mechanical device, is usually much better understood by the average die caster than the metal is. For this reason it would be expected that he would be more inclined to be critical of the functioning of the machine than of the "castability" of the metal. However, the importance of metal quality is certainly not being underestimated. Present day casting alloys are maintained very closely to the composition of best castability and the limit of variation is within and much more narrow than that allowed in the alloy specification. It seems that this high degree of uniformity and close control is most necessary when the die is not correctly designed. If the die can be put in good condition, it will be found that a large

share of the troubles we think are due to metal will disappear.

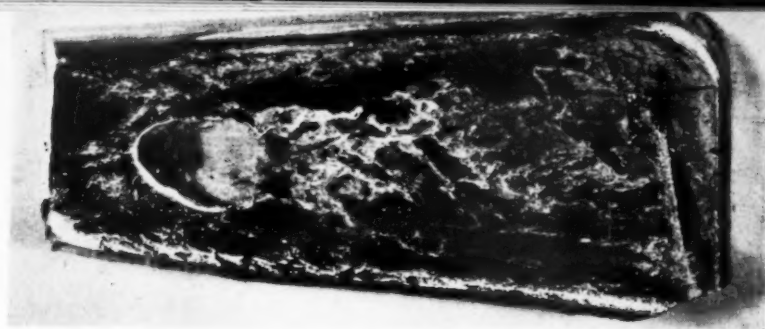
In discussing the design of the die as the most important factor to be considered when correcting surface imperfections in die castings, it is assumed that the alloy is held within specification. That the metal quality can have an important influence on surface defects is attested to by the fact that it is often necessary to hold the alloy within limits that are more narrow than the tolerances allowed in the specification in order to efficiently and consistently turn out good castings.

Most well designed dies will produce satisfactory castings consistently even though the composition of the alloy may vary to the extremes of the specification limits. But too often, either because of the shape of the cavity or the arrangement and design of the gates, runners and overflows, dies are extremely critical and will produce good castings only when the mechanical functioning of the machines is in perfect order and the alloy is constantly held at the composition of best castability. This places a burden of extra close control on the machine, the casting technique, and on the materials and process of alloying the metal.

Judging from experience with the Type 5 alloy, the composition for best castability must be maintained within the following limits:

Aluminum	3.9 % to 4.3 %
Copper	1.0 % to 1.25%
& Magnesium	0.03% to 0.04%
Lead / Cadmium / Tin	less than 0.003%
Iron	less than 0.05%

Sufficient metal control to guarantee such a small degree of variation would be expensive in equipment and time but the alloying department can aim for such composition and will, with average control, be able to maintain it a good percentage of the time.



**Fig. 6 is a magnified portion of a die casting surface affected by cold laps. Cold laps occur when two bodies of metal meet after having cooled to such a degree that it is not possible to make them mix intimately.**

When the alloy is of this composition, the solidification curve will show that there are no crystals freezing out above 740° F. In other words, the alloy will remain completely molten at least down to this temperature. The shape of the curve is affected by the aluminum content and to a lesser degree by the contaminating elements in solution. When the contaminating elements are not soluble in the melt to begin with, they will not affect the solidification curve but will influence the rate at which the molten metal will flow through an orifice. These two properties suggest means of checking the alloy in the shop and are used as a shop control at the Fisher Body-Ternstedt Division. The procedures are described in the process Specifications TP 805 and TP 806 appended. These tests must, of course, be supplemented by frequent spectrographic analyses in order to know the amounts present of minor impurities which information is necessary for proper blending.

The limit of responsibility of the alloying foreman in maintaining quality metal can only be defined by defining the quality of metal he is expected to produce and this can only be done by standardized tests. Therefore, the tests which he has available dictate the only criterion to which he can work. The present SAE and ASTM specifications

for zinc alloys should be accepted as defining a quality alloy and the die caster should acknowledge that when the alloying department must work to closer tolerances it is in most cases, helping him to get along with inferior dies, machines or casting techniques.

When the alloy is off-specification, certain casting difficulties and surface defects will be evidenced. Listed below are the major elements which, when outside of the limits of the specification, are most liable to be a source of casting difficulty.

#### **(1) Aluminum**

All of the generally used zinc base die casting alloys contain about 4% of aluminum. Besides contributing to the physical properties of the alloy and protecting it against undue iron pickup, the aluminum in the alloy is probably the most important single element contributing to castability. As the aluminum content drops below 4% there will be increasing difficulty in casting parts free of chills, cold-laps and swirls. This is hardly noticeable at quantities slightly below 4% but becomes quite prominent at 3.5% and lower. At 3% there will be difficulty with sink-spots in castings which have large differences in cross-section. Addition of copper does not help.



Fig. 7 shows a common defect known as a swirl. Corrective measures used to overcome this type of surface defect are essentially the same as for a cold lap.

• • •

The lower the aluminum is below the eutectic (about 5.0%) the higher will be the temperature at which solidification of the alloy begins. This higher freezing temperature cannot be efficiently compensated for by higher casting and die temperatures because of the limitations on die tolerances and the increase in shrinkage. Such a remedy would cause excessive flashing of the die and sink-spots as mentioned above.

Higher aluminum than 4.5% begins to contribute to brittleness of the cold casting and hot-shortness causing castings to break off in the die. This tendency reaches a maximum at about 5% aluminum.

Aluminum not only serves to protect the alloy against iron-pickup, but it also helps rid the alloy of iron by floating off iron in the melt as an Iron-



Fig. 8. Soldering or fusing will occur when fine particles of molten alloy are sprayed into the cavity at high velocity and strike a section of cavity wall where there is little or no wash by the main stream of metal.

• • •

Aluminum compound which can be skimmed off. Thus, aluminum is lost to some extent in remelting. In regular operation it will be found necessary to add extra aluminum to the remelt pots. The quantity of addition is difficult to standardize because the quantity lost depends on the amount of iron pickup and the condition of the scrap remelted.

## (2) Copper

This element varies from 0 to 3.5% in standard casting alloys. It contributes to corrosion resistance but at the same time makes the alloy less stable, both as to dimensions and mechanical properties.

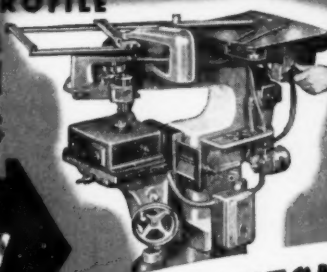
It promotes somewhat better castability by making the alloy less subject to sink-spots. Some copper is usually essential for castings which have ap-

# A Solution to

REPETITIVE PROFILE

## MILLING OPERATIONS

With  
**GORTON**  
and Tracer Control



**THIS JOB IS COMPLETELY AUTOMATIC**

This automatic milling and indexing job was accomplished with a standard Gorton Pantograph with special fixtures—just one of many possibilities of tracer control milling.

Gorton Tracer Controlled equipment includes duplicators, pantographs and electric arc cutters for milling, engraving, etching and many other metal removal operations. This equipment provides high spindle speeds, wide versatility and high precision—characteristics for which Gorton has been known for more than fifty years. It will give you to investigate Gorton Tracer Control methods now.

### Gorton Pre-Determines Results for You

Send us complete description with prints of your job. Our Engineering Department will send you a production estimate on the same job tooled on Gorton Tracer Controlled equipment—no obligation.

Send for Bulletin 1655 today! It contains information on all Gorton machines—what they are, what they do, how they operate.

**FREE . . .**

Use this handy coupon to get your copy of Bulletin 1655 at once.

Standard Gorton Tracer Controlled 3-U Pantograph with special fixtures profiles turbine impeller blades in one completely automatic cycle

### THE JOB IN BRIEF

#### Name of Part—Turbine Impeller

Qty. 100

Material—Commercial alloy.

Machining—Gorton Tracer Controlled 3-U Pantograph with special fixtures.

Operation—Mill 30 impeller blades in machined aluminum alloy blank with completely automatic feed and indexing.

Actual Cutting Time—1 minute per blade 30 minutes per impeller.

Cutting Tools—0.30" single flute cutter.

Remarks—Shape of cut determined by motorized master which drives the tracing stylus. Feed of cutter governed by special cam interlocked with indexing arrangement.



1 1/4" O.D.

PLEASE SEND WITHOUT OBLIGATION

Bulletin No. 1655

Name.....

Company.....

Position.....

Address.....

City.....State.....

**GEORGE GORTON MACHINE CO.**

*Tracer Controlled Milling*

1412 RACINE STREET • RACINE, WISCONSIN, U.S.A.



FROM GENERAL MANAGER

☒ PRODUCTION      ☐ TOOL DESIGN  
☐ PURCHASING      ☐ MAINTENANCE

Look up Lusol  
made by Anderson Oil  
Portland, Conn.  
I hear 14 exhibitors  
put it in 44 machines  
during the M.T. Show.  
It must be good. Order  
today for test soon.  
G. M.  
These people also make  
Rustavoid!

**TRY  
LUSOL**

**WRITE FOR DATA BOOK**

**ANDERSON OIL CO.**  
712 BROWNSTONE AVE.  
PORTLAND, CONNECTICUT  
MAKERS OF RUSTAVOID

Because of the greater hardness of the alloys containing copper, they are more easily machined and may trim more smoothly than the copper-free alloy.

Though magnesium is added to the alloy only in small quantities, primarily to protect it against the intergranular corrosion caused by lead, tin and cadmium, it also has a pronounced effect on the casting properties. It makes the alloy somewhat more sluggish to flow but though this would seem a drawback, in many ways it is beneficial to castability. Being less fluid, the molten alloy is less liable to spraying and splashing in the die cavity. Increasing the magnesium to about 0.04% will often clear up "splashes". With high magnesium, the die surface becomes quickly coated with a heat insulating film, which reduces the tendency of the casting to chill. Since spraying is reduced by addition of magnesium, it will be found that there will also be less trouble with "soldering" if the magnesium content is maintained within proper limits. As magnesium is increased above .05%, there will be a greater tendency for the castings to show cold laps and swirls. Above .08% the alloy is hot short.

High iron can be a contributing cause of practically any of the casting difficulties and surface defects known to the die caster. Special care should always be taken to keep the iron content as low as possible. The aluminum content, if kept within specification, will do much in this direction but further reduction can only be obtained by blending with a higher purity alloy.

There is some evidence that lead, cadmium and tin when close to the maximum limits allowed by the specifications will cause surface defects on

castings made in critical dies. Certain brands of zinc consistently run well below 0.002% lead with no cadmium or tin. When these brands of zinc are used there are fewer castings rejected for poor surface, all other conditions being equal. Other brands containing higher lead and some cadmium invariably cause a lowered efficiency in casting. When castings of high quality surface are required, it will be found beneficial to hold these elements to a low limit.

When lead, cadmium and tin appreciably exceed the maximum quantities allowed in the alloy (0.007% lead, 0.005% cadmium, 0.005% tin, total 0.01% max.) it will be found that the metal is hot-short and brittle. Sections will break off in the die and the castings will often fall off the gates.

High purity raw materials are always used in making up these zinc base die casting alloys. Contamination being

generally due to foundry pickup emphasizes the need for good housekeeping practice in the alloying department.

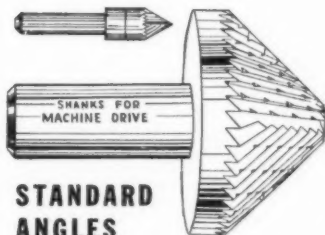
#### CONTACT WHEELS FOR ABRASIVE BELT POLISHING

4-page bulletin describes Neoprene Contact Wheels of special design, made in a wide range of densities and sizes. The various densities adapt abrasive belt polishing to a variety of work. Copy of Presto Bulletin 105 mailed promptly on request to The Manderscheid Company, Dept. 107, 810 Fulton Street, Chicago 7, Illinois.

#### HYDRO-POWER HYDRAULIC PUMP

Radial piston-type hydraulic pumps supplying pressures up to 3,000 psi. are described in a bulletin published by Hydro-Power, Inc., Belmont & Sheridan Aves., Springfield, Ohio. Dimensional charts for pumps rated from 1.25 radial gpm. to 185 gpm. are included, as are characteristic horsepower/volume/pressure curves. Three types of available control are described: constant pressure settings, automatic reduction of pump stroke at any desired point, and servo-reversing control.

## INSIDE DEBURRING CUTTERS



30° - 45°  
STOCKED IN 8 SIZES  
EACH ANGLE



SPECIAL ANGLES  
FROM STOCK BLANKS



HIGH SPEED  
STEEL



HANDLES  
FOR  
HAND USE  
(4 THREAD SIZES)

RADIUS TYPE  
10 SIZES

WRITE FOR BULLETIN NUMBER 15-I

**SEVERANCE TOOL INDUSTRIES INC.**  
722 IOWA STREET  
SAGINAW, • MICHIGAN

# NIAGARA



NIAGARA  
U 56

◀ The modern appearance of these Niagara Presses is significant of the talent and experience responsible for their functional design. Motor, flywheel, clutch and all gears are enclosed within the frame. They are widely used throughout industry.

The advanced design of Niagara Underdrive Shears makes possible accuracy plus high output per hour. Strong, rigid bed, crosshead and housings eliminate the necessity for continually adjusting knife clearance for each thickness of sheets. No exposed rotating shafts, eccentrics or belts. Write for bulletins. ▶

# ARA

# PRESSES SHEARS



DISTRICT OFFICES — NEW YORK • CLEVELAND • DETROIT

# ROTO

# Finishing

## METHOD FOR PROCESSING METALS

by  
**C. H. Castle,**  
Technical Director,  
The Sturgis Products Co.

Roto-Finishing is fundamentally a barrelling method employing wet mixtures of specially developed chips and compound, which provides flexibility in finishing ferrous and non-ferrous metals and alloys. Pioneered and patented by the Sturgis Products Company of Sturgis, Michigan, Roto-Finish performs four basic types of mechanical pre-finishing: (1) grinding and deburring; (2) polishing; (3) britehoning; and (4) coloring.

### DEBURRING

Heretofore, deburring has consisted of hand-finishing parts with polishing and buffing wheels and removing burrs with files, scrapers, flexible shaft grinders and wire brush wheels. Roto-Finishing expedites while producing comparable finishes on a quantity basis.

The parts are wet tumbled in mixtures of mineral chips and chemical compounds. The operation is performed in octagonal-shaped, wood-lined barrel-

---

**The Roto-Finishing method for deburring, polishing, britehoning and coloring metals can deliver production economies to the user. Principles and applications of this method are discussed.**

---

type units of the single or multiple compartment type.

These machines are made in six different sizes, ranging from 27" x 32" I.D. to 8" x 12" I.D. The horizontal cylinder is mounted on ball bearings, driven by an electric motor of sufficient horsepower, and equipped (optional) with a variable speed drive and automatic timer control device.

An unusual construction note is the patented compartment relining feature which extends productive life of equipment. Thanks to a removable back-

plate, old wood lining can be taken out from a compartment and new replacement lining installed with relative ease. Compartment doors, too, are similarly suitable for relining.

Even though the work is carried out in tumbling barrels, as equipment of this type is generally understood, the method cannot be called a tumbling process because it avoids the impacts of most tumbling routines. Parts remain immersed in the mixture. Since the work becomes virtually integral with the mass, which rises but a few degrees due to the low R. P. M. of the rotary movement of the octagonal barrel, parts are not thrown about, and so there are no impacts between them. A "sloshing" action is thus created, producing the desired scouring effect.

Rate of cylinder rotation and processing time vary, depending on the size and shape of the part to be treated and the degree of deburring desired. The following cycles have proved suitable

as determined by extensive tests and experiments.

<b>Metal Treated</b>	<b>Processing Cycle Time</b>
--------------------------	----------------------------------

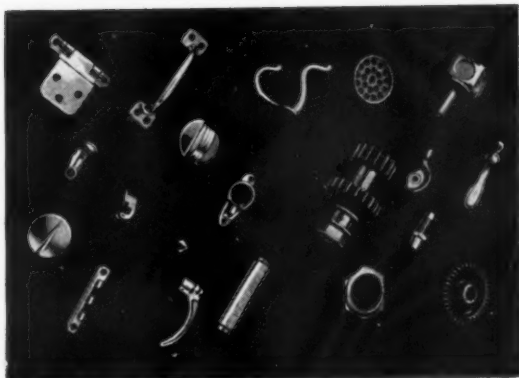
Aluminum, stampings, die castings .....	1/6—8 hr.
Machined brass .....	1/4—8 hr.
Sand, die castings, brass	3—24 hr.
Steel stampings, machined parts .....	1/4—12 hr.
Iron, steel castings and forgings .....	5—24 hr.

Other processing variables are chip size and type, and composition of compound. Because it is not a simple matter to predict the exact size of chip, type of compound, quantity of parts per charge, and cycle period best suited to produce optimum results at minimum cost in any given instance, Strugis maintains an experimental sample processing department for running tests under shop conditions simulating those prevailing in the prospective user's plant.



Roto-Finish grinds and deburs, polishes, britehones and colors tiny pieces weighing a fraction of an ounce as well as intricate-shaped parts weighing 75 lbs. apiece. It is a barreling method employing wet mixtures of specially developed chips and compound. Wet grinding or deburring brass, bronze, aluminum and zinc pieces takes 4 hours. Britehoning these products requires 6 hours. Total time for processing stainless and other steel parts ranges from 10 to 24 hours.

. . .  
 Twenty typical pieces, ferrous and non-ferrous, which have been treated by the Roto-Finish mechanical technique are illustrated here. Among them are an aluminum machine part, zinc die casting, steel forging machined and hardened, brass sand casting, and brass machined part.  
 . . .



Carefully presized and prepared exclusively for Roto-Finish use, grinding chips are available in 17 different sizes, from 1 3/4" in longest dimension, down to 1/16", and are identified by number from No. 1 for the largest through No. 7 for the smallest.

Chips should be of such size as not to wedge in any openings of the piece. While large chips cut faster than the small ones, they produce a rougher finish. To reduce processing time and produce a superior finish, use of large and small chips in combination is a rapidly-developing practice, particular-

ly for deburring small slots and recesses. The smaller chips generally flow through such openings without becoming wedged in them.

A combination of small chips is often recommended for treating unhardened steel parts on which a low microinch surface finish reading is wanted, and somewhat larger chips are suggested for hardened pieces. It is possible to bring down a 60-40 microinch surface finish to 30-25 microinches with grinding chips and from ten to



. . .  
 Experimental sample processing department maintained by The Sturgis Products Co. At this mechanical prefinishing "proving ground," Roto-Finish engineers conduct tests to determine cycle time, labor and materials costs, chips and compounds.  
 . . .

# IF YOUR WORK INCLUDES CENTERING

## ...You should have these **FREE Bulletins**

Here's helpful information on fast, accurate drilling and centering or milling to length and centering. Write for one or both of these booklets today.

**Sundstrand  
Drilling and  
Centering  
Machine**

**53A**



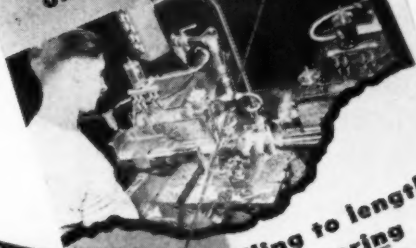
### **DRILLING AND CENTERING**

Drilling or centering on one or both ends of workpieces can be done fast with consistent accuracy with the 53-A Drilling and Centering machine. Complete data and specifications are included in this free bulletin. Ask for bulletin No. 467.

### **MILLING TO LENGTH AND CENTERING**

Maintaining a definite relation between ends and centers on shaft work is automatically controlled on this machine. Parts are milled and centered in same set up, saving handling time and insuring accuracy. For more detailed information write for bulletin No. 468.

*How to Save Time  
on shaft work . . . .*



*by milling to length  
and centering  
in one operation*



**SUNDSTRAND  
MACHINE TOOL COMPANY**

2535 Eleventh St. Rockford, Ill., U. S.

# Power Facing and Boring with ONE Tool Head

## CHANDLER DUPLEX

- 1 All operations in one set-up.
- 2 For Jig Borer, Drill Press, and Milling Machine.
- 3 Power feed engaged and disengaged instantly.
- 4 Adjustment for boring made in increments of one-tenth.
- 5 Cutting bar takes any position in Tee Slot of Slide.
- 6 Power feed for facing assures smooth, uniform movement of tool across work.
- 7 Any style shank available. Shanks are interchangeable.

Precision Constructed: feed screw and worm gear ground from solid; bronze feed nut and bushings.

Write for complete information.  
Profitable territories open.  
Prompt Delivery.



**STANDARD  
MODEL "D"**  
Slide Travel 1"  
Boring Capacity 8"  
**HEAVY DUTY  
MODELS**  
3 sizes of slide  
travel 2-1/2",  
3-1/2", 4-1/2"  
Boring Capacity 26".

**CHANDLER TOOL CO.**  
514 OHIO AVE., MUNCIE, IND.

10-5 microinches with britehoning chips.

The compound consists of alkaline and abrasive materials and serves the following functions:

- 1.—Lubricate both chips and parts in process.
- 2.—Prevent tarnishing, etching, or rusting of work.
- 3.—Help keep compartment and chip mass clean.
- 4.—Provide the amount of abrasive action required to produce the surface finish desired.
- 5.—Prevent glazing or loading of chips with fine metallic particles removed in processing work.
- 6.—Correct water deficiencies.

Compounds used vary with the requirements of the job. A mildly alkaline, abrasive material is intended for general application on unhardened ferrous parts on which a fine matte surface is desired, or where deburring is incidental to surface blending or production of a uniformly dull finish. However it is not recommended for application on parts that are finely threaded, have tapped or blind holes, or which have deeply recessed slots, because the compound or its abrasive becomes lodged in these areas.

A dry, non-abrasive, alkaline compound is used for producing a semi-bright finish on both hardened and unhardened ferrous work in a grinding operation for deburring, removing metal, or for producing a radius on the protruding edges of processed parts.

Another compound is advised for a dull matte finish for blending purposes on unhardened ferrous parts. This compound contains a coarser, harder abrasive than the first mentioned.

### POLISHING

Roto-Finish polishing is similar to grinding and deburring with one basic difference: it involves a "softer" action

# PERMANENT MAGNET CHUCKS

*... in a full range of sizes  
for a wide range of jobs*

● These useful production and toolroom aids are saving time and money on hundreds of toolmaking, inspection and hand operations ... also on light machine work and wet or dry grinding.

For sale only in the United States of America and its Territories. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

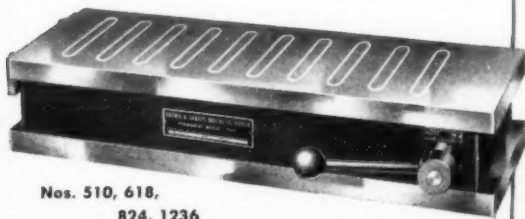
**No. 750 D Magnetic V Block** for holding iron or steel work of round or irregular shape. Capacity of V, 1 3/4" diameter.

**No. 255 Magnetic Chuck** for holding small or thin work in toolmaking and manufacturing or for inspection purposes. Working surface 2 7/16" x 5 1/4".

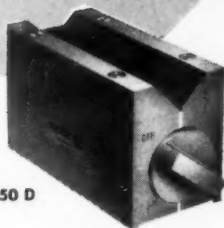
**No. 9 R Rotary Model Magnetic Chuck** for grinding operations, light cuts on lathes and for other light machine operations. Designed to accommodate table clamps. Working surface 9" diameter.

**Rectangular Models** ... for use on surface grinding machines and holding work for light cuts on planers, shapers and milling machines ... also for other light machine operations. Small sizes for hand finishing operations (readily portable). Working surfaces from 5 5/8" x 10 3/8" to 12 1/8" x 36"

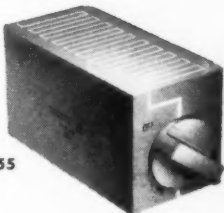
*We urge buying through the Distributor*



Nos. 510, 610,  
824, 1236



No. 750 D



No. 255

No. 9 R



- ECONOMICAL
- CONVENIENT
- SAFE
- NO WIRES
- NO HEATING
- NO INSTALLATION COSTS
- NO OPERATING COSTS

## BROWN & SHARPE



and requires the use of special "brite-honing chips" that possess less abrasiveness than the grinding chips. In cutting the work with greater mildness, their action is slower. However, the finish they produce is smoother than that turned out by the chips employed for deburring.

These britehoning chips are available in the same sizes as grinding chips. Depreciation, however, runs slightly higher than in grinding, amounting to approximately 5% for 24 hours' operation with britehoning chips as against 1% over the same operating period for grinding chips of the same size.

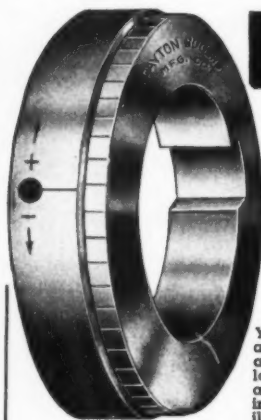
Polishing time varies from 6 to 12 hours in average production practice. However, when polishing follows a grinding operation, the cycle takes only 4-8 hours. The same compounds utilized in grinding and deburring application of the Roto-Finish process are also employed in the polishing phase.

## BRITEHONING

Britehoning is a combined polishing-honing operation which is the second and concluding stage of a two-step procedure. It follows the initial polishing operation reviewed above.

Through the use of suitable compounds and less abrasive chips than applied for deburring . . . in a specified formula as devised by Roto-Finish engineers . . . small parts are tumbled to yield a fine, semi-lustrous finish on ferrous and non-ferrous work. Polished pieces, together with the chips, are thoroughly rinsed in the compartment. Then, in order that the chips will act as a honing agent rather than a polishing medium, a special wet honing composition is added to the mass. Honing time ranges from 2 to 3 hours, with most of the brightening action transpiring within the first hour, and the change then tapering off.

The process proves adaptable to many



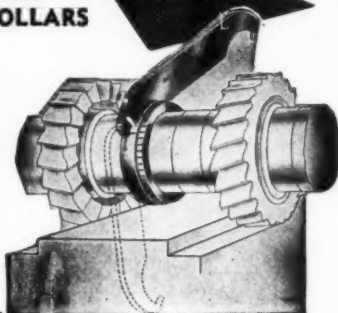
## FAST, ACCURATE SPACING

Graduated in thousandths, you have plus or minus .0005" at your fingertips with

**DAYTON ROGERS  
ADJUSTABLE  
SPACING COLLARS**

You can make an accurate, positive adjustment just by loosening the cutter arbor nut and making adjustment as illustrated.

*for*  
**SIDE MILLING  
CUTTERS  
GANG MILLING  
SET-UPS**

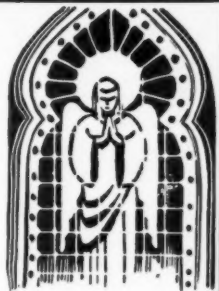


Made in 12 standards for cutter arbors from  $\frac{1}{8}$ " to 2". Write for Illustrated Bulletin 120-7.

**DAYTON ROGERS MFG. CO.**  
2849 12TH AVE. SO., MINNEAPOLIS 7, MINN.



**CENTRIFUGAL  
COOLANT  
PUMPS**



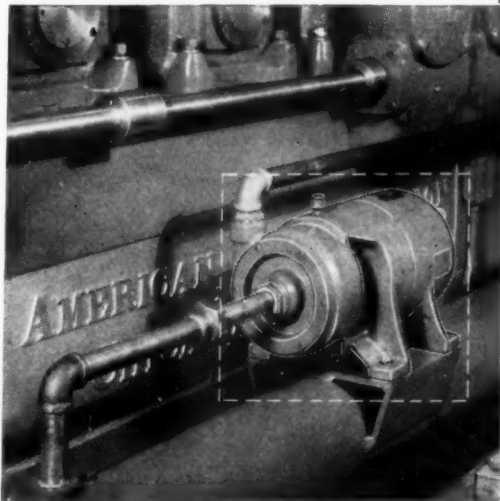
**FULFLO**

*wishes you the compliments  
of the season*      ★   ★   ★

**GOOD CHEER  
this Christmas ...  
GOOD FORTUNE  
throughout 1948**

• • •

This Fulflo Model AG6M Pump is mounted on a heat exchanger in a tube mill manufactured by American Electric Fusion Corporation, Chicago.



THE



Write on your letterhead for  
FULFLO MECHANICAL DATA BOOK

**Specialties Co., Inc.**  
BLANCHESTER, OHIO

different types of parts as a preplating operation, and already its usage is widespread for mechanically prefinishing automotive parts; building, plumbing, and general hardware; household appliance components; fishing tackle; sporting goods, tools, and business machines prior to electroplating, anodizing or painting. Parts can be brite-honed directly after forming or trimming operations if there are no deeply penetrating die and stretcher marks present. Die castings may be processed directly, too, when parts are closely trimmed.

General work-load recommendations previously outlined for wet polishing operations also apply to britehoning.

### WET COLORING

Wet coloring is suggested for parts that have been processed by any one preceding Roto-Finishing method or combination procedure. The mass in this case consists not of chips, but of steel balls or other highly polished coloring agents.

The mass-workload ratio depends upon the size of the compartment. Size of ball used is governed by the size

and hardness of the part to be colored. Three specially designed types of compounds may be used, depending on whether the work is ferrous or non-ferrous in nature.

One is a highly alkaline blend of water-soluble materials that produce a high luster on iron, steel, stainless steel, and nickle alloy parts only. This particular composition also may be employed with chips to descale heat-treated ferrous parts which are not scaled up too excessively.

The second compound, a slightly acidic, dry-type material, produces a high luster on brass and copper alloys principally, but is suitable also on aluminum and its alloys, copper, brass and silver plated parts. It is not used with britehoning chips due to an adverse chemical reaction.

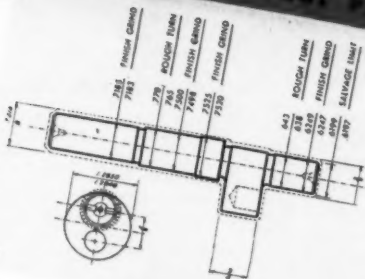
A mildly alkaline blend of chemicals, the third wet-coloring compound, is used with steel balls or other highly processed polishing media to color copper and its alloys, such as brass and bronze, and aluminum and zinc alloys. It also can be used with grinding chips for producing a bright finish and nor-



• • •  
**Loading a Roto-Finish Machine for wet grinding, deburring, polishing, britehoning, or coloring operations. Electric overhead hoist and swivel hoist pan loads tray of parts into the octagonal, wood-lined barrel with recommended mineral chips, chemical compound and water. according to special formula for each type of processing.**  
• • •

for more pieces  
per grind its..

# V-R\* CARBIDES



Job No. OC675

Dept. Production

**Reference File:**

**Crankshaft,  
Machining.**

## SETUP DATA

**SETUP DATA**

Part:	Crankshaft for compressor unit
Material:	Pearlitic Malleable Iron (163-207 Brinell)
Operation:	Complete machining of crankshaft
Machine:	New Britain Gridley Model 86 Double Index
Tools:	5/8" square V-R carbide grade EN
R.P.M.:	778
Feed:	.010

**DETAIL DATA:**

**DETAIL DATA:**

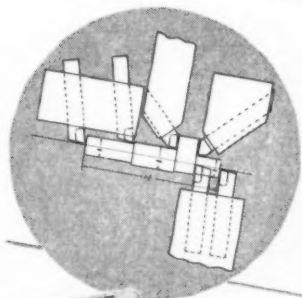
Pieces per grind (V-R Carbide)	650
Pieces per grind (Other Carbides)	435

There are 14 tools per set up on three machines and three different sized crankshafts run on three machines. The Genesee Hollow Mills for this same job are tipped with V-R carbide grade EM. On the basis of comparative tests, no other carbides come within 25% of V-R CARBIDES AVERAGE PERFORMANCE.

Ask your nearest Vascology-Ramet Field Office for the main plant for additional information.

Ask your nearest Vascotol-Ramet Field Engineer or write to the main plant for additional information on V-R carbide field performances. A V-R Field Engineer will gladly help solve your carbide problems without any obligation on your part. REMEMBER when you specify V-R you specify the world's finest carbide and field engineering service.

\* Reg. U. S. Pat. Off.



**SEND TODAY** for your free copy of the VR-400 Carbide Tool and Blank Catalog. 32 pages of comprehensive carbide tool and engineering information.



**VASCOLOY-RAMET CORPORATION** NORTH CHICAGO, ILLINOIS, U. S. A.  
District Sales and Service in Principal Cities

mal deburring on parts which cannot be britehoned or wet colored economically. Where a high luster is desired, parts to be wet colored must be cleaned and treated so that they not only are in oilless, greaseless and non-scaled condition, but also free from burrs or other surface defects. In most cases, it has been found advisable to britehoned the work before wet coloring it.

The work-load commensurate with efficient operations, depends on variables such as shape, hardness, results expected and condition of parts prior to processing. In arriving at their recommendations for any prospective installation, Roto-Finish engineers focus primary attention on weight of work-load, but they are equally cognizant of the importance of work-load volume when processing stampings or castings of thin gage material having a relatively large volume in proportion to the weight of the part.

#### VIMCO MACHINE LIGHTS

Four-page folder illustrates Vimco line of general machine lights for localized incandescent high-intensity lighting. Six standard models, a list of interchangeable parts for special lights, and order instructions are given. This folder is of particular interest to Superintendents, Safety Engineers, Electrical Engineers, Design Engineers, Shop Foremen and all others concerned with production efficiency. Vimco Manufacturing Company, Dept. BB, 105 Brayton St., Buffalo 13, N.Y.

#### RESISTANCE WELDING MATERIALS

Weiger Weed & Co., division of Fansteel Metallurgical Corporation, has released a 24 page booklet on resistance welding materials. The booklet contains listings of specifications and prices and information on Recommended Electrode Materials for Spot Welding Similar and Dissimilar Metals, Helpful Tips for Better Welding, Recommended Welding Practices, etc. Weiger Weed & Co., Divn. of Fansteel Metallurgical Corp., 11644 Cloverdale Ave., Detroit 4, Mich.

**WHITNEY-JENSEN PRODUCTS**  
30 YEARS EXPERIENCE

**WE  
MANUFACTURE  
A COMPLETE LINE**

*of  
Maintenance  
and  
Production*

**Tools and Machinery**

**WRITE FOR  
NEW CATALOG 17-46**

**WHITNEY METAL TOOL COMPANY**  
115 FORBES ST. \* ROCKFORD, ILL.

#### **C E R W E C O STEEL APRON BRAKE**

**NOW AVAILABLE IN  
4, 6 AND 8 FT. 14 GA.**



**EASE AND SIMPLICITY  
HAND OPERATED  
ENGINEERED AND BRACED  
TO DO THE JOB RIGHT  
FULLY GUARANTEED  
QUICK DELIVERIES  
WRITE FOR CIRCULAR**

**WM. C. JOHNSON & SONS  
MACHINERY CO.**  
1211 Hadley St. St. Louis 6, Mo.

# Letter from England



ROBERT HUTCHESON, Editor  
MACHINE SHOP MAGAZINE (London)

The ups and downs of a firm making equipment used in practically every type of mechanism are a good barometer of the engineering industry. At the recent annual general meeting of the Ransome and Marles Bearing Co., Ltd., makers of ball bearings, the chairman Mr. Fred W. Baker commented on the difficulties encountered by reason of shortages of labour, fuel and steel. In spite of all the difficulties the sales during the past year were a peace-time record. Orders on hand today are greater than those of twelve months ago. In pre-war days the motor car industry absorbed over 50 per cent of the firm's output and although this percentage has dropped the motor car industry is taking as great a volume as ever, a state of affairs showing that vast numbers of ball bearings are being used by makers of other classes of machinery. Recent years have, in fact, seen the application of ball and roller bearings to an ever increasing number of types of machine, a point that is indicative of the steady movement towards higher efficiency in all types of mechanism.

Up to August 23rd a total of 35,689 Polish workers had been placed in employment in this country by the Ministry of Labour. Placings during the two weeks ending August 23rd amounted to 2,427.

Of the total number in industry, 5,241 have entered agriculture and forestry, 6,307 building and civil engineering, 4,728 coal mining, and 1,847 brick, tile and pipe making. The remainder are working in smaller numbers in over fifty different industries and occupations.

The first batch of European Volunteer Workers with previous coal mining experi-

ence, numbering thirty, has been sent forward for preliminary training at a Coal-mining Training Centre. It is anticipated that further numbers of both experienced and inexperienced coalmining volunteers from among the E.V.W.'s brought to this country will proceed to preliminary training and will be placed in coalmining employment at intervals in the near future.

The recent exhibition "Radiolympia" held in London contained a wealth of new development. Apart from the domestic radio and television sets which naturally attracted many of the visitors there were many exhibits that gave an indication of "industry in the future". The war years saw many developments in the science of electronics, and many of the new principles were demonstrated in spectacular ways at the exhibition. A demonstration of particular interest was on the stand of the British Thompson-Houston Co. Ltd. in the form of an electronic-amplidyne remote position-control servo mechanism. The feature of such a system is that, by giving a small angular movement to a small force, a considerably larger force can be controlled accurately at a remote location. In the demonstration equipment a visitor, by gently blowing a vane, could accurately position a weight of 200 lb.

Controls of this type, which were used considerably during the war for the accurate positioning of guns, searchlights, radar aerials, etc., will undoubtedly have many applications in industry where an extremely small initiating force is required to control powers of considerable magnitude. Such applications include the accurate positioning of high-power cranes; precision actuation of large hydraulic

valves from delicate measuring instruments; and profile milling machines where torques of many tons-feet can be controlled by input torques of ounce-inches.

The value of United Kingdom exports for September was £99.0 million. Apart from July, when the value was £110.3 million, this is the highest value in any month since the war.

The increase over August (£5.4 million) was largely due to September having an extra day, (26 as against 25 in August), but the daily rate was slightly better than in August. Both months' figures were affected by holidays, which caused exports, as usual, to be smaller than in July. Taking 26 days (excluding Sundays) as a normal working month, exports since the beginning of this year have been in million £.

January	88	April	89½	July	106
February	82½	May	89½	September	99
March	82½	June	101	August	97

Exports of machinery and vehicles in September each amounted to £15.6 million, being respectively \$1.7 million and £1.1 million and £1.1 million below the peak figures for July. The number of new motor cars exported (12,582) and of pedal cycles (129,600) was the highest on record.

Imports in September (160.7 million) showed a substantial reduction from those in August (£174.0 million) and July (£179.2 million).

The rise in exports in September, coupled with the fall in imports, caused a reduction of £18.5 million in the unfavourable balance of trade. In September the adverse balance was £58.3 million. Though less than August (£76.8 million) and July (£64.7 million), the September figure was higher than in any other month.

Figures for certain engineering exports for the third quarter of 1947 and for the two preceding quarters are:

	First Quarter 1947	Second Quarter 1947	Third Quarter 1947
Machinery	£39.7 million	£41.6 million	£48.1 million
Vehicles	£32.8 "	£38.8 "	£45.8 "
Iron & Steel			
Manufacturers	£18.5 "	£20.4 "	£22.6 "

Rolls-Royce, the company that is world famous for its automobiles and aircraft engines, is to increase its capital in order to obtain further finance to carry out its present programme. The capital is being increased to £2,250,000 by the creation of another £1,350,000 ordinary £1. shares.

The Lord President of the Council has decided that the new Mechanical Engineering Research Station, which is being set up by the Department of Scientific and Industrial Research, will be sited in Scotland. In addition, sub-stations for Fuel Research, Building Research and Road Research are also to be established in Scotland by the D.S.I.R.

The Mechanical Engineering Research Station is intended to undertake basic or generic work of the type which forms the groundwork of mechanical engineering de-

velopment and, in so doing, to supplement the invaluable work already being undertaken by leading Government, industrial and university establishments in the mechanical engineering field.

It was originally thought that the new station would be best located within 50 miles of London. The concentration in the London neighbourhood of other related scientific establishments, of user Government Departments, and of the headquarters of all the leading scientific, technical and professional institutions, bring undoubted advantages to research workers in the area. Furthermore, the mechanical engineering industry is so widely dispersed throughout the country, that a site near London would be advantageous for facilitating contact between the station and the industry.

Similar arguments might be advanced for almost every other Government Research Station, existing or projected. Thus, if each one were to be decided solely on scientific and technical ground without taking into account national, sociological and strategic considerations, the result might well be that all major Government research stations would be concentrated in the London area.

The Government has been increasingly concerned about the tendency for every new focus of industrial interest to become concentrated near London. To counteract this tendency the Coalition Government passed the Distribution of Industry Act; in furtherance of this policy firms are discouraged from building factories in certain areas, including London, and are encouraged to site them in the Development Areas, thereby helping to balance the economy of each industrial area. In relation to this policy Government research establishments had also to be considered. In so far as research is becoming increasingly a vital factor in industrial development, it is clear that to some extent they should confirm, so as to produce a

more even distribution of research activity throughout the country.

There is a large Development Area in Scotland. Between the wars Scotland failed to secure a correct share of the newer industries and newer developments in existing industries and, in consequence, felt the full impact of the depression in 1930. A contributory cause of the failure was the remoteness of centres of current research.

Scotland has an important engineering industry with a distinguished record and the engineering faculties of the Universities of Edinburgh and Glasgow and the Royal Technical College of Glasgow have a high reputation. The Government has been seeking to encourage the growth of the light and medium engineering industries in the Scottish Development area.

Broad national considerations in the end determined the decision to locate the new station in Scotland, where it will undoubtedly be an aid to local as well as national development. Taken in conjunction with the establishment of local branches of the Fuel, Building and Road Research Stations it will provide a con-



**BIG NEWS** ANNOUNCING 1½ INCH CAPACITY

*Levermatic*

## COLLET CHUCK

**FOR ALL TURRET AND ENGINE LATHES**

Added to  
**THE OVERWHELMINGLY  
 APPROVED 1-INCH SIZE  
 RECENTLY INTRODUCED**

**PROVED STEPPED UP  
 PRODUCTION 50 TO 100%.**

- Assures greater speed and accuracy
- Stronger, more positive work grip
- Maximum ease of operation
- Simple finger-tip adjustment

See Your Distributor or Write for Catalog

**PORST BROS MFG. CO.** 261 N. California Ave.  
 Chicago 12, Illinois

Manufacturers of Collets and Fingers for 25 Years

West Coast Office: PORST SALES, 132 W. Union St., Pasadena 1, Calif.

siderable extension and diversification of research facilities available in Scotland.

One rather interesting effort at promoting overseas sales of machine tools, small tools and measuring equipment is a floating exhibition. E. H. Jones (Machine Tools) Ltd., have an exhibition of the various lines they handle set out in the M.V. **St. Merriel** which sailed from London on 10th September to visit South America. At the time of writing the **St. Merriel** is approaching Rio de Janeiro, and it will call at Santos, Montevideo, Buenos Aires, and Rosario where visitors can view the machines and other equipment on board. Several of the firm's experts have sailed to demonstrate the exhibits which include precision lathes, automatics, drilling machines, a jig borer, punch shaping machines for tool room use, presses, a dieing machine and much measuring equipment.

Before she sailed a reception was held on board the **St. Merriel** which was attended by the Argentine Ambassador and

representatives from the Brazilian, Argentine, and Uruguayan Embassies.

The abolition of basic petrol (i.e. an allowance of petrol for non-business purposes) is causing consternation amongst the motoring public, the second-hand car dealers and the motor manufacturers.

The cessation of a basic allowance means that several thousands of motorists who do not use their cars for business purposes will not be able to put their vehicles on the road while those motorists who have been receiving a petrol allowance for business use in addition to the basic allowance will only get the business quota and will be able to use their cars only for business purposes.

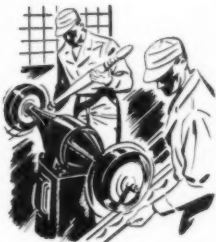
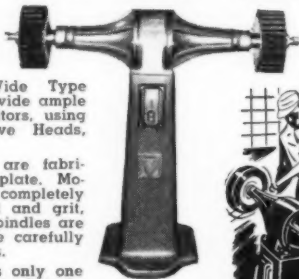
It is now stated that it will be illegal to use petrol substitutes for cars, e.g. methane gas or producer gas, one reason for this being the shortage of steel that would be needed for making the gas generating equipment. THE END.

## PERFECT FOR TWO MAN OPERATION

The Vonnegut Direct-Drive Wide Type Spindle Stand is designed to provide ample working area so that two operators, using Vonnegut Brush-Backed Abrasive Heads, may work at one time.

Vonnegut Spindle Stand bases are fabricated of heavy all-welded steel plate. Motors, either 1 HP or 2HP, are completely enclosed to protect against dust and grit, and carry overload protection. Spindles are of one-piece construction and are carefully machined to accurate dimensions.

The Wide Type Spindle Stand is only one of the many types of Vonnegut Spindle Stands available to meet your needs. Each type of stand is available with 1200 rpm or 1800 rpm motor. For further details, write to:



# V



VONNEGUT  
BRUSH BACKED  
SANDER HEADS



VONNEGUT  
ELECTRIC  
MOULDERS



MARSCHKE  
GRINDERS  
& BUFFERS

### VONNEGUT MOULDER CORPORATION

1809 MADISON AVENUE • INDIANAPOLIS 2, INDIANA

# AIR OILED

## by NORGREN Lubricators

The fastest, most positive method known for lubricating air driven tools and cylinders.

Automatically inject clean oil into the airstream, creating an oil-air fog which travels with the air. This coats all moving parts of the tool or cylinder with protective film of oil.

Works only when the tool runs. Protects *all* the time against

- (1) excessive wear while tool operates**
- (2) rust and corrosion while tool is idle**

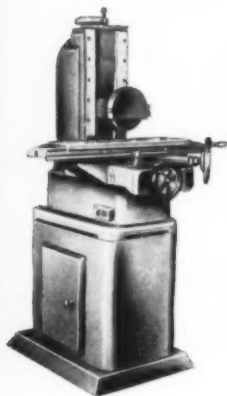
End lubrication troubles the NORGREN way . . . oil the air that drives the tool.

Write C. A. Norgren Co.  
222 Santa Fe Drive,  
Denver 9,  
Colorado.

*Norgren*



## EXCEL Model No. 7 SURFACE GRINDER



a new hand-  
feed surface  
grinder in  
the low-priced  
field

### PRICE

**\$535.00**

**Bench Model  
(less motor)**

**F.O.B.  
Benton Harbor,  
Michigan**

A machine designed specifically for grinding tools, dies and other tool room work. Its extra heavy construction makes it suitable also for many production jobs. Operation is simple—controls are conveniently located. **Sealed-for-Life**, ball bearing mounted spindle, hardened spiral pinion and rack, and ground cross-feed screw are your guarantee of fine finishes, smooth table operation and long, accurate machine life. Furnished in bench or floor models.

Working Surface 5½"x10½"  
Longitudinal Table Travel 12"  
Transverse Table Travel 6½"  
Capacity Under 7" Wheel 9"  
Net Wt. Floor Model 825 lbs.

**Send  
for  
Bulletin  
MT-127**

*Designed and Manufactured by*

**COVEL MANUFACTURING CO.**  
**BENTON HARBOR MICHIGAN**

## ASTE'S PRESIDENT STRESSES BETTER HUMAN RELATIONS

"To insure peace in our industrial democracy, we must become more proficient in the science of humanics and the art of human relations," was the theme of a speech delivered before the American Society of Tool Engineers in Pittsburgh by W. B. Peirce, national President.

Mr. Peirce believes that a program of closer cooperation between management and workers is essential if we are to avert the chaotic conditions periodically threatening us."

Tool engineers, he contends, are in a particularly advantageous position "some place about half way between management and labor," and can do much toward interpreting "management to labor and labor to management."

Mr. Peirce continued with the thought that the science of "humanics," would receive increasing emphasis in future industrial history. He maintains that better human relations lead to increased production and, between nations, will avert future wars.

Today America must produce the commodities to save inhabitants of a "war-weary world" from unbelievable and inhuman suffering. But even more important than this, we must kindle the fires of freedom within the hearts and minds of those we are to save from famine and misery. . . .

"Nations that are aided by the American productive machine . . . will be less prone to accept the ideologies imposed upon them by those who can do so little toward solving their urgent economic problems."

Upon better human relations "resolve not only industrial peace in our nation, but peace among the nations of the world."

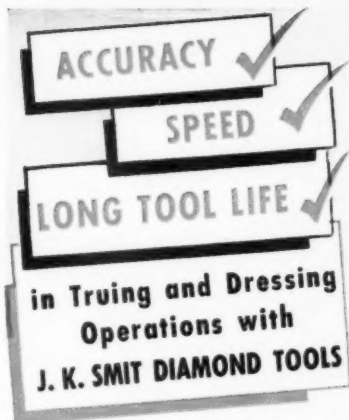
## A.S.T.E. HOLDS SEMI-ANNUAL CONVENTION IN BOSTON

A well known machine tool executive recently told us that the greatest production increases will, in the future, probably come through better tooling, utilizing modern machine tools. This will place a weighty responsibility on the shoulders of the tool engineers, directly in charge of tooling operations. There should be no doubt over the caliber of today's tool engineers and their ability to meet all tooling problems, if the recent successful semi-annual convention of the American Society for Tool Engineers is an example of their intelligence and ingenuity.

The 15th semi-annual convention of the A.S.T.E. was held in Boston, October 30, 31 and November 1. Over 1,000 tool engineers, production executives and other engineers came from all parts of the country and from Canada to keep abreast of latest metal-working developments. Technical papers presented at the convention covered a wide range of subjects, testimony to the broad knowledge modern tool engineers must possess to meet the constantly changing production demands.

Approximately fifteen plants, manufacturing everything from timepieces to gears, were visited during the three-day convention. Many of these plants performed extremely interesting operations by means of intelligent and ingenious tool planning, which were carefully studied by the visitors.

During the morning, those remaining behind from the plant tours, and not wishing to attend the technical session then in progress, had an opportunity to see several fine industrial films on magnesium, honing and several institutional employee-relations films. Enough technical and non-technical interest was provided to meet the individual needs and tastes of conventioners.



**ACCURACY** ✓  
**SPEED** ✓  
**LONG TOOL LIFE** ✓  
**in Truing and Dressing Operations with J. K. SMIT DIAMOND TOOLS**



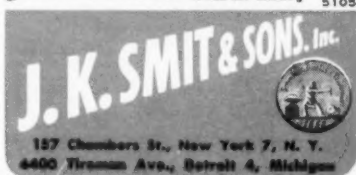
### JKS STANDARD TOOLS

To assure uniformly successful results, the finest in diamonds, materials and workmanship are blended into every J. K. Smit Standard Tool. And you can count on *exact* dimensions for every make of grinder. In ordering, state the grinder manufacturer's name and type of machine.



### JKS FORM DRESSING TOOLS

Designed to dress abrasive wheels with speed in any variety of shapes required, J. K. Smit Form Dressing Tools are made with selected diamonds that permit close tolerances, high finish and long tool life. Blade and chisel tools, cone shaped, pyramid type and other dressers with formed radii and specific included angles are available. Write for catalog; 5105



**J. K. SMIT & SONS, Inc.**  
157 Chambers St., New York 7, N. Y.  
4400 Fireman Ave., Detroit 4, Michigan

# Put the POCKET SIZE MACHINE SHOP" to Work!

Moto-Tool No. 2  
With Emery Point

**\$16.50**



Approx.  
27,000  
R.P.M

Dremel's improved Moto-Tool... the little electric grinder that does jobs... can save hours, by speeding work now being done by hand. Invaluable for sharpening files, drills, gauges, rasps, tools and cutters without tearing down set-ups. Dremel Moto-Tool is a "war veteran"... used by all branches of the Armed Forces in far-flung repair bases... helped set production records at General Electric, Westinghouse, Remington Arms, Ford, Nash, Aviat, Northrup, Douglas and other plants.

## LOOK FOR THESE MOTO-TOOL FEATURES

Housing has "pencil-type" finger grip • Instant-action, wrenchless chuck • Oil-less, sealed, trouble-proof bearings • Patented automatic chuck lock pin • Oversize armature shaft, hardened, ground and polished • 110 volt, universal type (AC-DC) motor • Easily replaced commutator brushes • About 27,000 R.P.M. cuts faster... saves cutters • Sliding snap-type switch • Handy hanger hook • Cord protector • Sturdy, shockproof bakelite housing • Dust-sterilized air-cooling system • Weighs only 13 oz. • Shaped to fit the hand • Dynamically balanced for vibrationless operation.

## MOTO-TOOL KIT NO. 2



With 23  
Accessories  
**\$23.50**

PREWAR  
PRICES  
STILL  
PREVAIL

Moto-Tool Kit No. 2, with 23 accessories (high speed steel cutters, grinding wheels, polishing accessories) and heavy-duty professional Model 2 Moto-Tool in natural finish, hardwood case... \$23.50. (Items purchased separately would cost about \$30.00; you save \$6.50) ... Moto-Tool No. 2, with one emery point... \$16.50.

See Your Mill Supply Dealer. If he does not handle Moto-Tool, write the factory.

**DREMEL MANUFACTURING CO.**

Dept. 217-M, Racine, Wis.

## YALE & TOWNE'S PRESIDENT DIES

The Yale & Towne Mfg. Co., New York, N. Y., regretfully announce the death of their president, W. Gibson Carey, Jr., well known industrial and civic leader, on October 4, 1947.

In Florida for a meeting of the American Society of Sales Executives, Mr. Carey was swimming at Ponte Vedra Beach when a strong undertow dragged him down. He was 51 years old and had served as president of Yale & Towne for the past 15 years.

His widow, the former Eleanor Towne, their two children, and a brother are survivors.

Mr. Carey had the reputation for being one of the country's top businessmen among business news writers and industrial leaders because of his effective combination of strong merchandising ability with financial talent, together with an understanding of human relations and manufacturing problems.

Business interests ranged over a wide scope and he served as a director of many companies. Renown as a public servant, civic leader and philanthropist shared the spotlight with his reputation for business acumen. He served in World Wars I and II, and was a member, and for a while vice chairman, of the U. S. Department of Commerce Business Advisory Council, serving Secretaries Jones, Wallace and Harriman.

Business success for Mr. Carey was mercurial. In 1919, he entered the paper and pulp business in New York, as a salesman. At the same time he took night courses at Columbia University in accounting and business management. From 1923 to 1926, he was secretary and treasurer of the Philadelphia Paper Manufacturing Company. In 1926, he became general manager of the Philadelphia Division of the Container Corporation of America.

In 1929, he was elected to the Yale & Towne board of directors and later in that year joined the company as assistant to the president. Advancement to vice president-treasurer followed, and in 1932 he was elected president, succeeding Walter C. Allen when the latter became board chairman.

At the time of his death, Mr. Carey was a trustee of the Mutual Life Insurance Company of New York, and the Consolidated Edison Company of New York, Inc., and a director of the Irving Trust Company, Colgate-Palmolive Peet Company, New York Telephone Company, and Armstrong Cork Company and Research Corporation.

# Rousselle

NO. 3 OBI 25 TON  
HAVE THE SPECIAL

**PUNCH PRES**  
**FEATURE**

#### Hardened and Ground Ways

Ways are made of hardened and ground steel assuring accuracy and long life to the slide. Dies will stand up longer under continuous operation.

#### Heavy Reinforced Frame

Advanced design, massive construction, of high-tensile semi-steel casting, heavily ribbed, to resist distortion.

#### Roller Bearing Flywheel

Solid web flywheel is mounted on two sets of roller bearings.

#### Removable Bearing Blocks

The complete crankshaft assembly and bearing blocks can easily be removed or replaced without any fitting or adjustment. Maintenance is quick and simple.

#### Round Pin Clutch

Clutch is of simple and sturdy design, using a round clutch pin made of chrome nickel alloy steel, hardened and ground engaging in three drive pins. Positive one revolution device which can be quickly changed for repeat operation.

#### Front Operated Inclining

One man can easily and safely incline Press to 30 degrees with ball bearing inclining device at the front of machine.

#### Ground and Polished Crankshaft

Crankshaft is made of high carbon steel, ground and polished with ample bearing surface, with removable and renewable main bearings.

#### Large Die Space

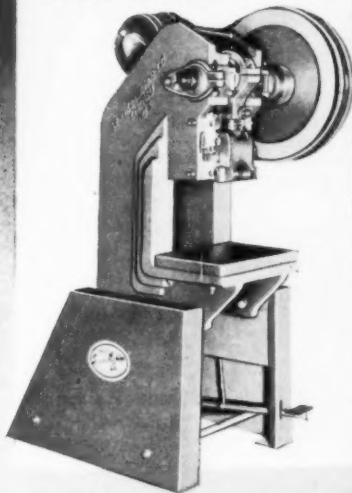
Distance from slide to bolster stroke down, adjustment up is 9" center of slide to frame 7" opening through back 9½".

**THAT MEAN HIGH  
PRODUCTION  
AT LOW COST**

**PRECISION MADE  
FOR LONG SERVICE**

Rousselle Punch Presses are used extensively in many branches of industry throughout the world. They are an answer to the urgent need of a low cost, precision built and dependable press. It is designed to meet today's demand for high production, low maintenance and continued operation. Engineering skill, heavy construction assures meeting the severity of service to which they are subjected, thus insuring high production at low cost. Years of experience in design and testing goes in the manufacturing of Rousselle Punch Presses.

These Presses are used for blanking, embossing, piercing, forming, drawing and for many other special operations.



**OTHER PRESSES: 5-10 TON OBI BENCH MODELS, 5-10-15 FLOOR MODELS  
15-25 HORN WITH ADJUSTABLE BED . . . SEE YOUR DEALER OR WRITE**



**SERVICE MACHINE COMPANY**

**7633 S. ASHLAND AVE., CHICAGO 20, ILLINOIS**

# Salient Features of Handwheel Design

by

H. F. Williams

Hand manipulation of machine tools and other accessories is too often taken for granted. True, a decision must be made, whether to use some sort of handle or handwheel, and if the latter is chosen, many times the specific type is left to chance. Drawings previously made are consulted, or the book of standards is perused, or still further, the pattern storage shelves and bins are looked over. When the "right size" is located—well, that's the wheel that is destined to be used on the machine.

However, handwheel design should be explored much deeper. The designing engineer or the person responsible for such specifications can learn from the machine operator, by observation, consultation or otherwise, just what design he must apply for the greatest efficiency of operation. A number of leading questions present themselves to be decided correctly before proceeding towards a successful conclusion. 1. Must the handwheel be used for long traverses with ultimate fine adjustment? 2. Will there be excessive vibration present to necessitate the use of a balanced handwheel? 3. Will operation be facilitated if bearing overhang can be reduced to a minimum by the use of a dished handwheel having off-set spokes?

There might be a possibility that the conventional variety of handwheel is

---

**This is the first of a four part series on the design of handwheels prepared by H. F. Williams, noted design engineer. Factors influencing the design of handwheels, rim designs, and positive grip handwheel rims are discussed in the first installment.**

---

undesirable. 4. Can a spokeless, webless or modernistic or even futuristic type of design be used to advantage? 5. Should a knob or knobs be used in place of handles, but if the latter, should they be of the solid type, or will manipulation be enhanced by specifying a rotating or free type as among those illustrated in the article on handles of the latter style as appeared in the August, 1946 issue of the MACHINE and TOOL BLUE BOOK?

If the conventional variety of handwheel is to be used, the designer must decide, 6. What kind of spoke or arm will be appropriate; straight, tapered or curved, rectangular or oval cross-section, light or heavy? 7. Is the rim to be smooth, scalloped, fluted or otherwise ribbed, to make hand gripping more secure? What should be the shape of the rim section, round, partially round, square, rectangular or some other shape as octagonal as will be portrayed further on?

8. What material should be used, time-honored cast iron, steel casting or steel forging, aluminum or the ever-growing, popular plastic? 9. Will the handwheel be finished by turning, polishing, form-grinding, knurling, nickel or chromium plating? How far around is the rim to be finished and what parts are to be left rough for filling and painting or lacquering? 10. What method of manufacture will be used to make the handwheel, sand casting, die molding or fabrication by solid rod, tubing and sheet metal, the latter for the spokes or ribbing.

So the purpose of this article is to discuss the answers to the foregoing ten questions and to show by the various sketches, the several components that make a handwheel. Instead of presenting all the drawings of entire handwheels, whereby much valuable space would have to be sacrificed, and too much repetition resorted to, enlarged sections of rims, spokes, webs, finger grip scallops and flutes and shapes will be shown. Locations of handles and knobs and other salient features will appear. It should be noted that this article does not claim to be so comprehensive, that individualism cannot manifest itself. Where appearance is artistic, as well as utilitarian, the motif or general theme of decoration on the machine can be carried into the design of the handwheel itself.

When the conventional handwheel is thought of, a picture is formed of a round sectional rim or torus, joined to a central hub with a few spokes. The form that the rim takes in the mind is probably round, but many shapes are available. The individual need only take a walk through a modern or even antiquated machine shop and observe the various forms of rim. The designer certainly had a reason for shaping the rim section as he did. The accompanying sketches show these varied shapes.

In Fig. 1, the rim section is a true circle. Whether the handwheel is chucked from within or by the hub, or if it is finished on an arbor, the operator must rotate the tool so that nearly five-sixths of the circle is turned. The tool must form from the inside of the spoke all around to the outside of the spoke. The section in between is left rough or buffed out with a soft wheel after it is dressed with a file for comparative smoothness.

The rim in Fig. 2 is reinforced by a rib running around the inside of the rim and blending into the spokes. In this rim the sides of the reinforcing rib taper up tangent to the periphery of the circle. Here then the operator must turn two tapers, both opposite, and still finish the rest of the circle.

In an effort to have a well defined

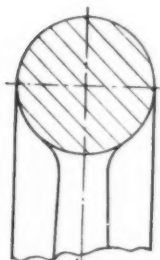


Fig. 1.

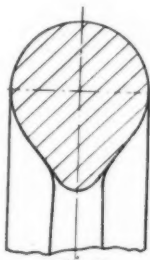


Fig. 2.

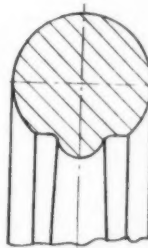


Fig. 3.

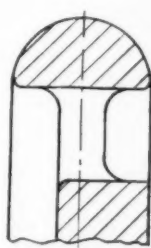


Fig. 4.

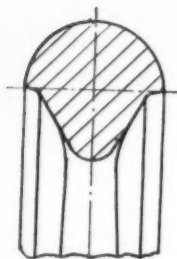


Fig. 5.

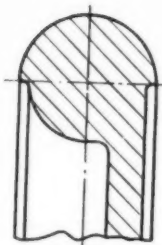


Fig. 6.

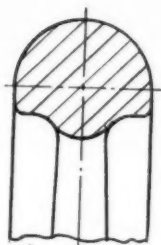


Fig. 7.

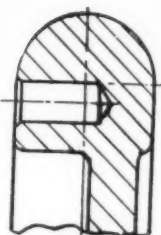


Fig. 8.

line of demarcation between the finished and unfinished portions, the design in Fig. 3 was devised. The tool must describe an arc of approximately  $270^\circ$  but it starts and stops without the necessity of blending in the rim with the spokes or reinforcing rib. However, the sharp edge that remains on either side must be dressed off with a file or tool while still rotating. The reinforcing rib is not quite as high as that in Fig. 1 and is daintier in shape and volume.

To further simplify the forming of the outer periphery of the rim, a half-section is sometimes used as in Fig. 4. As illustrated, such a rim is strong enough where the spoke is short in length or where sufficient width and thickness of spoke joins both the rim

and the hub. It is possible with this design to use a half-round concave shaped forming tool and shave the rim until it trues out. Here also, the sharp edges must be smoothed over. In the proportions shown in the sketch, no reinforcing rib between the spokes around the inside of the rim is necessary.

When it is desired to reinforce a large handwheel with a rim such as is shown in Fig. 4, a large rib is shown attached to the rim in Fig. 5. These proportions are such that the height of the rib is equal to the radius of the rim. It is sometimes desirable to turn the short flat at the centerline of the rim, especially when a wobbling effect would be present if the flat were not machined. Of course, there is nothing to

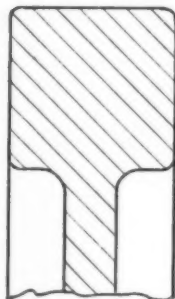


Fig. 9.

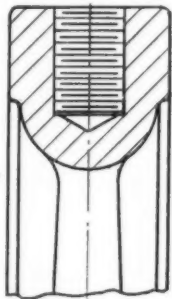


Fig. 10.

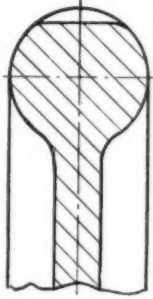
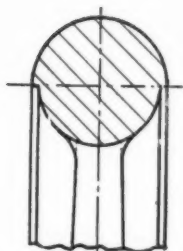
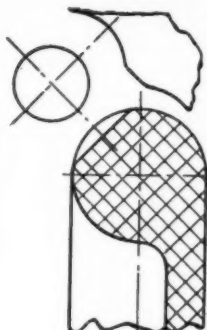


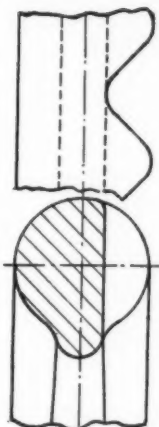
Fig. 12.



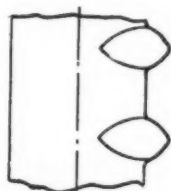
*Fig. 11.*



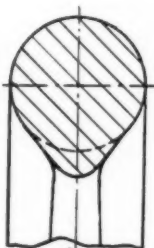
*Fig. 13.*



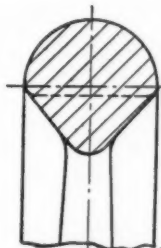
*Fig. 14.*



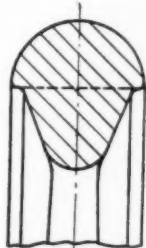
*Fig. 15.*



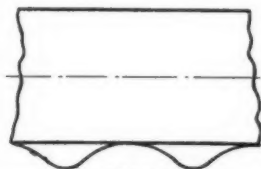
*Fig. 16.*



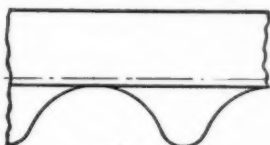
*Fig. 17.*



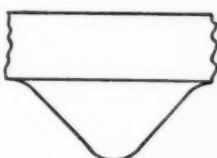
*Fig. 18.*



*Fig. 19.*



*Fig. 20.*



*Fig. 21.*

hinder taper twining the sides of the reinforcing rib to blend into the spokes as was explained in Fig. 2. But this is hardly necessary as long as the flat is trued up.

The same half-round concave forming tool can be used on the rim in Fig. 6. Instead of spokes, this handwheel has a solid web between the rim and hub. The inside of the rim is rounded slightly smaller in radius than the outer part. Two other shapes have been formed on such a handwheel namely a continuous surface of the same diameter from the right center around 270° to the inner vertical center. In other words, the forming tool of 180° concave, is set around 90° to the original setting thereby finishing the inner 90° of the circle. In another design, the amount of finish left on the periphery but slightly greater than the rough inside. The finished surface was blended into the rough surface. This procedure is hard on the tool as it is bound to

cut scale where the blend takes place. As shown in the sketch, a very effective appearance can be obtained by painting the rough interior several shades lighter than the lacquer on the rest of the machine. Not only is there a color contrast but the polished surface of the rim is contrasted with both colors.

The contour of the rim in Fig. 7 is a modification of that shown in Fig. 4 in that the volume of metal is greater thereby increasing its strength. The same forming tool can be used to shave the periphery of the handwheel. The both sides tangent to the circle are brought down parallel about 1/4 inch from the centerline. After the rim is formed half-round, the sides are faced with a conventional turning tool. In this way, there is more metal so that a hole can be drilled and reamed and a handle assembled.

In fig. 8, the side faces are carried down still further on the web-type of

**NEW!**

**FOOL-PROOF,  
ABUSE-PROOF!**



**MORSE TAPERS 1 TO 6  
PRICED \$22.50 TO \$75.00**

**DISTRIBUTOR INQUIRY INVITED**

**Bulflex** **LIVE CENTER**

**SPRING LOADED  
TRIPLE EXTRA HEAVY  
For Extreme Precision**

- NON-CHATTERING.
- SELF-COMPENSATING.
- MASSIVE LOCOMOTIVE-TYPE BEARINGS (NOT needle bearings).
- TOLERANCES: .0001".
- HARDENED AND GROUND.
- GUARANTEED AGAINST DEFECTIVE MANUFACTURE.

**THE BULTOOL COMPANY • 715 Latham Square Bldg., Oakland, Calif.**

handwheel. This is done particularly so that there is enough flat surface to accommodate the hole for a handle. This hole is drilled and reamed below the centerline of the circle so that the assembled handle does not project up on the rim circle. A number of illustrations further on in this article will show additional views of assembled handles with reasons for their various locations in the rim.

Sometimes it is required to obtain a flywheel effect while spinning the handwheel. On screw operated mechanisms where numerous revolutions of the handwheel are necessary, it is particularly beneficial to have the weight of the rim as great as possible, consistent with good design and pleasing appearance. In such instances a square or rectangular cross-section of the rim provides enough volume of metal. Such a rim is shown in Fig. 9. In this case the handwheel is webbed rather than being made with spokes. Simple turn-

ing and facing operations make for ease in finishing. If a balanced wheel is required the wheel can be finished all over. If not, then the inside surfaces of the squared rim can be trued up and the rest of the interior left rough for painting.

To get away from the appearance of massiveness, a design can be used on a flywheel type of handwheel as shown in Fig. 10. In this example the solid square effect is brought down only half way from the outer surface and the rest rounded down to blend into the spokes. The rounded bulge need only be deep enough to accommodate the tapped hole for the series of handles spaced equally about its circumference. Considerable time is saved in the facing operation over that shown in Fig. 9. The appearance of massiveness is reduced considerably although the volume of metal is only slightly less than in the previous design.

The design illustrated in Fig 11 is an

## **SAVES TIME -- MAKES MONEY** **MARSHALLTOWN THROATLESS SHEARS**

**CUTS ANY SHAPE**  
**CUTS ANY SIZE**  
**CAPACITY UP TO 1/4" STOCK**

Here's the shear that offers best performance features. Cutting speed 6' per minute. High grade tool steel cutters. Write today for details. Prompt shipment.

**MARSHALLTOWN MFG. COMPANY**  
**900 Nevada Street      Marshalltown, Iowa**

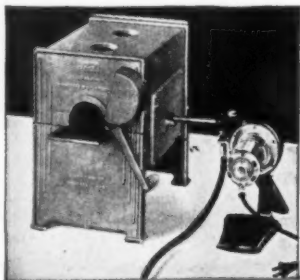


# **"Stark"**

## **"ELECTROBLAST"**

### **High Speed Muffle Furnace**

*attains high speed heat  
in 20 minutes*



**No. 1 Furnace, as shown, muffle opening 7 x 3 1/8 x 2 1/8" complete with independent blower or torch and metal gas hose. . . . . \$80**

**No. 2 Furnace, muffle opening 7x4 5/8 x 3 1/2" with built-in blower & gas hose. \$138.**

**Operate on city or tank gas for 7 to 10 cents per hour.**

**Built of best materials, they do high grade small work handily and efficiently**

**Adequate pyrometer equipment extra, if desired.**

*Write to us*

**Stark Tool Company**

Established 1862

**WALTHAM, MASSACHUSETTS**

*Originators of the American Bench Lathe*

example of a cast iron handwheel rim finished as explained under Fig. 6, but has spokes instead of a web, which spokes are centrally located. This design can be contrasted to that of Fig. 1. In the latter, a plastic handwheel can be made to conform to that shape which needs only flash removed and lightly polished. Practically the same effect can be had with Fig. 11 especially where the finished round is blended into the rough round or stepped only slightly.

### **Positive Grip Handwheel Rims**

When long traverses are required of the mechanism which the handwheel controls, it is necessary to have a handle on the wheel assembled parallel to its axis. If a fine adjustment is to be made after the lengthy traverse is completed, or if inching of the mechanism must take place, then the rim is gripped by the hand and the rotation continued. An oily hand gripping a handwheel rim that is smooth on both outer and inner surfaces is not a positive way for fine adjustments. It is true that the hand and fingers abutting a spoke will be sufficient for such an adjustment, but if the handwheel is webbed instead of being spoked, it is a different matter. Then too, the distance between spokes is sometimes so great as to require a second or third try of the operator, especially if he is observing the work and gropes for the proper place on the wheel. A three spoke handwheel in this instance is a good example.

Therefore, a notched, milled, indented, fluted or scalloped surface of the rim is necessary. A number of examples of these uneven surfaces are shown in the following illustrations, all of which are being used successfully. Some of these scallops and notches are simply polished from the rough casting to smooth down or flatten out the small protrusions left by the molding

Another "First" in



# Streamflex

A  
MULTI-SPEED  
Completely  
NEW

## CABINET MODEL Flexible Shaft Machine

### Safe...

Because all pulleys and belts are fully enclosed.

### Convenient...

EASY DOES IT! A slight upward pull and the cover slides off—for changing speeds.

### Modern...

In design — completely streamlined. ALL WELDED STEEL CONSTRUCTION. No castings to break.

5 Models to choose from.  $\frac{1}{2}$ ,  $\frac{3}{4}$  or 1 H.P. Speed ranges from 1400 to 6000 R.P.M. All shafts have WYCO Patented Non-Metallic Innerliner. Illustrated — No. 37-H —  $\frac{3}{4}$  H.P. 3600-6000 R.P.M. 7 ft. shaft and stand. equip.

**\$190.00**

Write today for complete information on these new machines.

**WYZENBEEK & STAFF, Inc.**  
**841 W. Hubbard St. Chicago 22, Ill.**

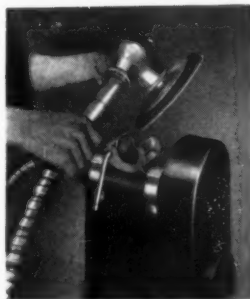
When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK



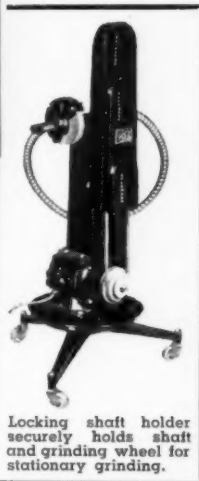
BALL BEARING  
SWIVEL  
MOTOR BASE

LOW CENTER OF  
GRAVITY

16" TOOL TRAY



Cover easily removed for belt changing, all pulleys and belts completely covered.



Locking shaft holder  
securely holds shaft  
and grinding wheel for  
stationary grinding.

# Buy KIPP AIR GRINDERS Because

The RPM's stay up while grinding ... not only when the grinder runs idle.

It is an established fact that surface speeds must stay up to approximately a mile a minute if you want to grind — not just rub. The speed of Kipp air grinders drops but slightly when put to work. That means better work—longer wheel life.

Buy Kipp air tools for best results, lower prices.

MODEL JA  
50,000 R.P.M.

**\$33<sup>25</sup>**

IN U.S.A.



Weight 12 ounces;  
length 6 $\frac{3}{4}$  inches;  
chuck size  $\frac{1}{8}$  inch.  
Wheel guard re-  
moved for better  
illustration.

**MADISON-KIPP CORP.**

207 Waubesa St., Madison, Wis., U.S.A.

- Skilled in DIE CASTING Mechanics
- Experienced in LUBRICATION Engineering
- Originators of Really High Speed AIR TOOLS

operation. Others are actually machined to give the handwheel an over-all finished appearance. In one instance, the surface is left rough as cast and painted which is said to provide sufficient anti-slippage qualities.

The inside of the rim is a favorite place for these finger scallops but this design does not dominate the field. The tops, sides or angular locations in the rim are also favored. Just when these callops started to appear on machine tool handwheels has not yet been ascertained, but the automobile manufacturers used many forms of positive grips on the handwheels of their cars. One has only to take hold of a modern plastic wheel of polished smoothness to see how easily the fingers engage the indentations somewhere on the rim surface, and have the sense of assurance that the hand will not slip around the wheel.

In Fig. 12 the pattern of the hand wheel is grooved by the pattern maker, the grooves being equally spaced around the circumference. After the round shape has been finished into the web on either side, the grooves are buffed out to a pleasing blend into the finished surface of the rim. Because of the web in this wheel, it is really the fleshy part of the hand below the little finger that engages the grooves to prevent slippage.

The aluminum handwheel in Fig. 13 has been notched at a 45° angle, these notches being fairly close together as shown in the auxiliary view. A milling cutter was used and the finished groove gives a circle effect when viewed from a 45° angle. The blending edges of the cut into the rim are polished slightly so that no sharp edges remain.

The rim shown in Fig. 14 is scalloped on the side away from the operator's position at the machine. A study of the sketch will show that the designer wished to finish the rim with a forming tool whereby the tops of the scal-

"Look, Hotchkiss! We replaced set-up wheels with Armour belts to increase production, not to help you keep up with the Book of The Month!"



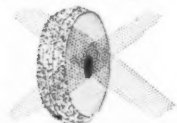
## WHY USE COATED ABRASIVE BELTS?



No glue to mix!



No wheels to dress!



No uneven surfaces!

**They grind Faster, Better!** The urgent need for faster, better production is responsible for the conversion to the abrasive belt backstand method of grinding and polishing from the old set-up method. Coated abrasive belts when worn take 75% less time to replace than is needed to dress a wheel. They reduce inventory problems due to elimination of wheels, glue, cements and various grains.

**They are More Accurate!** Accuracy of the work never varies regardless of the wear on the belt. Furthermore, these coated abrasive belts greatly reduce the danger of discoloring, warping and flowing caused by frictional heat.

**They are More Economical!** Abrasive belts do not require trained personnel needed to dress set-up wheel. They also improve quality of work with less operator fatigue, thus boosting production while lowering costs.

Armour's uniform-factory-made abrasive belts are only part of Armour's complete line of abrasives designed especially to give you better performance, longer wear, greater economy. Come and talk over your grinding and polishing problems with Armour's technical representatives.

**ARMOUR and Company**



*Coated Abrasives Division*

1355 WEST 31ST STREET • CHICAGO 9, ILLINOIS

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

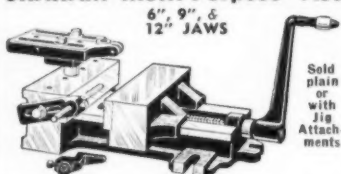
187

**Take a look  
at this book**

**REQUEST  
BULLETIN 41**



## **GRAHAM Multi-Purpose Vise**



The above booklet illustrates in detail how this versatile vise provides square, V and shell jaws and stops to accurately position a wide variety of shapes, plus numerous attachments for drill and tool guiding. Here is a ready-made jig or fixture for repeat-operation work on drill press, radial, miller, planer, shaper, grinder. Sizes to 124 lbs.

## **"Adjust-angle" KNURL HOLDER**

**Many  
patterns  
using only  
straight  
knurls.**



The above booklet contains full details of prices and work capacity, dimensions, patterns, etc., applying to this famous Knurling Tool which fits lathe turret or tailstock. Graduated scale permits guide adjustment of straight knurls to various positions for various straight, spiral or checkered patterns. Capacity up to 2 1/2" dia.

For prices and details request Bulletin 41

**Graham Mfg. Co.**

55 Bridge st., East Greenwich, R. I.

lops would fall into the circle and not protrude therefrom. The depth of scallop is such that the bottom lines up with the side of the spoke and rib, which however, is not necessary.

The protrusions on the rim of the wheel shown in Fig. 15 are also on the back away from the operator. They are egg-shaped both ways, looking from the side and from the top. Made in cast iron it is only possible to finish the rim from the top centerline or just beyond a little to the right around to where it joins the web. This type of handwheel would be better finished if it were plastic molded as greater smoothness could be obtained between the protrusions, thereby providing a better feel to the hand.

In Figs. 16, 17 and 18 and also in Figs. 19, 20 and 21 are examples of the popular inside scallop. In Figs. 16 and 19, a shallow scallop has been cut into the rib that connects the spokes. Of course, the smaller the scallop the greater the number can be placed between the spokes. In some instances it is desirable to have at least four to accommodate the four fingers of the hand. Center to center or the pitch of the scallops should range from 1 1/4" to 1 1/2".

The scallops in the rim shown in Figs. 17 and 20 are somewhat deeper than those in Figs. 16 and 19. Here the outer periphery of the rim is finished half-round and the volume of metal in the scallops is greater than in the previous example. In both Figs. 16 and 17 the contour of the scallops in views 19 and 20 is curved to more readily fit the shape of the fingers. In Figs. 18 and 21, the scallop is of considerable depth and pitch, the thought here being that the two fingers are accommodated in the space between two adjoining scallops. This rim is also finished, but only halfway around the circle. It is sometimes impossible to buff out the inner surface of the rim.

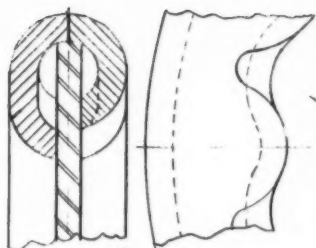


Fig. 22.

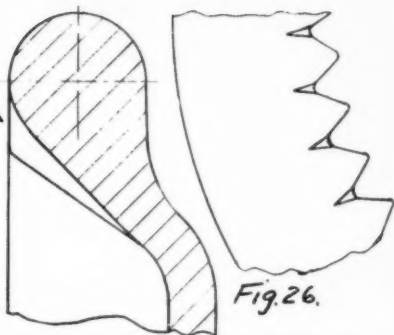


Fig. 26.

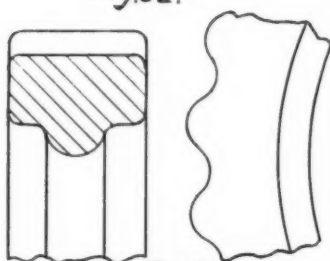


Fig. 27.

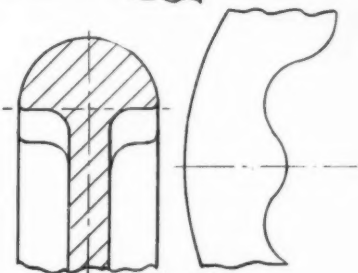


Fig. 23.

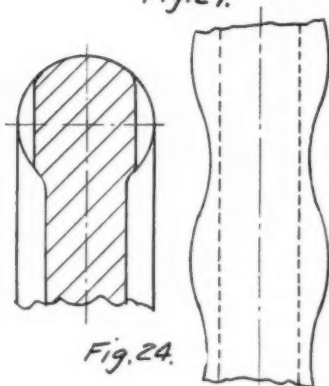


Fig. 24.

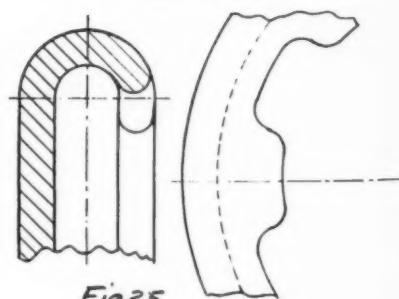


Fig. 25.

Comparatively smooth castings are required especially for the scallop surfaces.

Most handwheels having scallops on the inside of the rim have at least three or more such protrusions between each spoke. However, one handwheel was observed to have only one, having a height from the rim inner surfaces greater than those already shown. In fact it really was an abbreviated spoke that forgot to join the hub. All the foregoing types of inside finger grips have been for spoked wheels. Such scallops, although of not such a prominent nature, can be applied to flanged or webbed wheels as well.

A good example of a built-up handwheel having a solid flange or web is shown in Fig. 22. This wheel made of a plastic two-part rim manipulates a popular speed collet chuck. The two plastic pieces are centered about and fastened to a steel plate that becomes the handwheel web. The faces of the joint are carefully matched to become a continuous rim in which the joint is not discernible. The two halves are fastened to the plate by screws. The leverage between the outer rim of the handwheel and the point of application is great enough that an almost effortless turn of the wheel opens or closes the collet to release or grip the work as desired. The four fingers engage the scallops on one side, the thumb the other side, while the palm of the hand contacts the outer rim. The general shape of the plastic rim sections can be noted in the sketch, one side of the centerline being a cross-section through the inner edge of the scallop, the other side being sectioned through the dip at the bottom of the scallop. This construction makes a very smooth and pleasing finger grip application.

Deeper finger-gripping surfaces are illustrated in a cast iron wheel of web-type construction and shown in Fig. 23.

The scallops are quite deep so that a firm grip can be had. They protrude out straight from the web. Looking in from the end as in the view at the right the surfaces are curved. The sides are finished below the centerline of the rim-circle and must be dressed off so that sharp corners do not exist.

In Fig. 24, another form of hand grip is illustrated. The top or center of the bulb forms a circle while the cross section is taken through the narrow part. The rim can be turned if desired but it can be seen that the tool will only clean off the high points of the bulb. With this type of hand scallop it is better to polish the wheel from the rough using a soft rag impregnated with abrasive. The shape of the bulb is comprised of easy curves and allows polishing off quite readily.

The handwheel in Fig. 25 is of different construction. The body of the wheel is merely a straight flange curved over at the rim. It can be form-finished and faced. The face away from the operator is scalloped as is shown in the end view at the right. This is a lightweight handwheel but looks solid when viewed from the front. The shape of the scallops can be altered to suit the fancy of the designer.

The inside tapered face of the handwheel in Fig. 26 is fluted angularly as shown, disappearing at the inside vertical face. The view at the right is looking into the face of the wheel in the direction of the arrow. The outer surface is form-finished, the smooth surfaces being carried down the sides both at the flutes and at the rear vertical surface.

In Fig. 27, the squared section of rim is corrugated on the outer face. The sides are faced to a smooth finish but the corrugations are buffed smooth. The palm of the hand creases into the scallops in the rim while the thumb and fingers hold onto the rib between the spokes.

Several more positive grip type rims for handwheels will be shown and explained in the second section of this article to appear in a forthcoming issue of the BLUE BOOK. The question of what type, shape and size of spoke to use and finger room involving rim, hub and spokes will be discussed. The theory of using balanced handwheels will be illustrated in numerous sketches, showing the offset weights at the rim, in the spokes or on the hub. In a third article of this series, unusual shapes and contours will be shown together with the use of dished handwheels, large and lightweight wheels, and handle positioning. The fourth part will deal with handled and knobbed wheels also various kinds of specialized types.

Part two of this four part series will appear in a future issue of the MACHINE and TOOL BLUE BOOK.

#### **WEAR-TESTING ACCESSORIES**

12-page technical bulletin on wear-testing issued by Taber Instrument Corp., No. Tonawanda, N. Y., describes and illustrates new, improved accessories and other standard supplies designed to step up efficiency of abrasion-resistance analyses with the Taber Abraser.

Among the units discussed are devices for continuously removing abrasings from wear-track on test specimen, controlling test operating time, refacing and standardizing abrading wheels, and preparing thin, flexible materials for testing. Taber Instrument Corp., 111-MTBB Goundry St., No. Tonawanda, N. Y.

#### **CONTINUOUS EXTRUSIONS**

This 12-page booklet gives analytical descriptions of modern methods used in continuous extrusion takeup operations. It contains engineering drawings and specification tables and is fully illustrated. Technical information is included on a constant tension continuous takeup machine, extrusion systems for wire, cable, monofilaments or tubings, and analytical descriptions of large-cooling capacity plastic tubing takeups with water submerged capstans. Engineering Dept., Industrial Ovens, Inc., 13825 Triskett Rd., Cleveland 11, Ohio.

#### **MATTISON GRINDING AND POLISHING MACHINE**

4-page bulletin describes Mattison Wide-Belt Sheet Grinding and Polishing Machine using factory coated belts for grinding stainless steel and alloy sheets. Pictures of the machine show its heavy construction and adaptability to quick application of belts as well as use of a grinding attachment for the grinding contact roll. Mattison Machine Works, Dept. BB, Rockford, Ill.

#### **GILMER TIMING BELTS**

A six-page folder is being offered by the L. H. Gilmer Co., of Philadelphia, belting specialists. Timing Belt; Speedage-Kord, an all cord belt; and Multiple V-Belts are described. Pictures show the belts in use, and the many uses to which belts are put in industry are listed. L. H. Gilmer Co., Tacony, Philadelphia 35, Pa.

#### **VARIABLE SPEED A. C. DRIVE**

A new four page bulletin describing an alternating current motor having infinitely adjustable speed is now available. The Louis Allis Company's Ajusto-Spede provides a variable speed output with a constant torque characteristic through an eddy current principle. Louis Allis Co., 427 E. Stewart St., Milwaukee 7, Wis.

#### **SKF BEARING CATALOG**

How anti-friction bearings increase the rigidity and accuracy of machine tool spindles, many of which are being equipped with the spectacular carbide tools that permit greater speeds, feeds and depth of cut is explained by SKF Industries, Inc., in a new comprehensive 60-page catalog of machine tool bearings and spindle designs.

Bearing applications for turning and boring equipment and grinding machines are discussed in detail.

A section devoted in engineering principles relates cutting tool loads to bearing life and also deals with bearing selection, load distribution, speed limitations, mounting and distribution. Other sections touch upon bearing tables and load data, for cylindrical roller, thrust ball and angular contact bearings, tolerance tables and shaft and housing dimensions.

A description of the oil mist lubricator developed by SKF and designed to lengthen the life of spindle bearings from several hundred to as much as several thousand hours is contained in the catalog which is illustrated with numerous charts and diagrams.

## TOOL AND DIE MANUFACTURERS MEET

The National Tool & Die Manufacturers Association held its second National Membership Convention on November 2-5, at the Benjamin Franklin Hotel, Philadelphia, with a nationwide representation over 200 contract tool and die executives. A varied program of speeches and technical meetings featured the 3-day sessions.

A convention highlight was a report, "Industry's Future in an Explosive World," written by Marshall M. Smith, President of the E. W. Bliss Co., Detroit, on his recent industrial tour of Great Britain, France and Belgium. Mr. Smith was unable to deliver his address because of illness; his report was presented by Ray H. Sullivan, Vice Pres. in charge of Manufacturing of the E. W. Bliss Co.

Mr. Smith urged that the United States be careful of its timing in respect to any foreign lending program. "Continuation of the lending policies we have followed to date," Mr. Smith said, "can only serve to bolster the present socialist regimes and prolong their tenure of office and at the same time postpone sound reconstruction. In this international political game today dollars are like dynamite. They can do us a lot of good if wisely used, and they can create a lot of trouble and future distress for us if not used with infinite skill."

Mr. Sullivan, in his address following Mr. Smith's report, predicted a bright future for both the tool and die and pressed metal industries. He pointed out that the constantly increasing cost of labor and materials has been responsible for a large demand for automatic presses which has been responsible for a marked trend toward the use of progressive and compound dies.

Another program feature was a panel discussion on "Getting Best Results in Tooling", with two purchasers

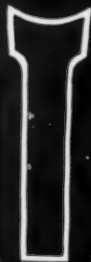
of tooling and two shop owners presenting their arguments. The moderator was Burnham Finney, Editor of American Machinist.

Representing the customers were Samuel H. Paul, Supervisor of Tool Purchases, Heintz Manufacturing Co., Philadelphia; Ralph Allen, Assistant Supt., Tool & Plant Maintenance Div., Western Electric Co., Kearny, N. J. Representing the show owners were C. W. Holmberg, Pres., August W. Holmberg & Co., Inc., New York, and H. E. Ehrhardt, Pres., Norwood Engineering Co., Dayton.

Other events included a paper entitled, "Realistic Methods of Estimating", by Richard F. Moore, Pres., Moore Special Tool Co., Inc., Bridgeport, and Chairman of the National Tool & Die Manufacturers Association's Business Management Committee. A. R. Gieringer, President of the A. R. Gieringer Tool Corp., Milwaukee, was the discussion leader.

It was the consensus of opinion among the delegates that tooling for new models of all products is now beginning to come out in full force and the tool and die industry will be "extremely busy for the next three to five years". The chief reason for this extensive retooling is that, with consumer demand for present models tapering off, manufacturers are preparing to compete for the consumer dollar with new models. The following officers were elected by the National Tool & Die Manufacturers Association for 1947-1948: Pres. William R. White Jr., Midwestern Tool Co., Chicago; First Vice-Pres., J. J. Kohl, International Tool Co., Dayton, Ohio; Second Vice-Pres. John H. Benetz, Bridge Tool & Die Works, Philadelphia; Secretary, Centre W. Holmberg, August W. Holmberg & Co., Inc., New York; Treasurer, Jerome Stanek, Stanek Tool & Mfg. Co., Milwaukee, Wis.

# THE CUT-OFF BLADE THAT LASTS AS LONG AS THE OTHER TOOLS IN YOUR SCREW MACHINES



## *Why?*

Because its design—unlike that of any other cut-off blade—gives free release to chip. The hollow-ground top causes chip to collapse, allowing it to fall freely.

Chip restriction thus being removed, the cause for excessive friction is eliminated (blade breakage is decreased); and the life of the blades is consequently extended to match that of the other tools in the screw machine set-up.

The angular side clearance, too, provides for reduction of friction. These features, which distinguish the T-shape design of Empire Tool Company's Luers Patented Cut-off Blades, furnish ample reason why you should be using these cut-off blades for increasing your production.

PRODUCED UNDER LICENSE ISSUED BY JOHN MILTON LUERS PATENTS, INC.

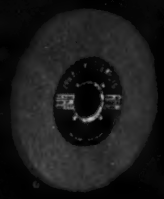


774 GRINNELL AVE.

DETROIT 13, MICHIGAN

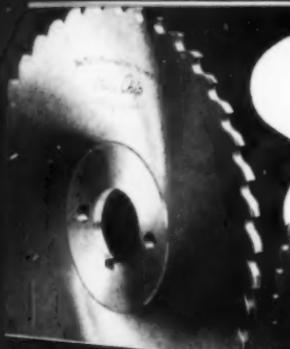
**Headquarters for  
MOUNTED WHEELS and SMALL GRINDING WHEELS**

# Streak



CHICAGO WHEEL & MFG. CO.  
GRINDING WHEELS  
AND ALL KINDS OF GRINDING  
MACHINERY  
CHICAGO, ILL.





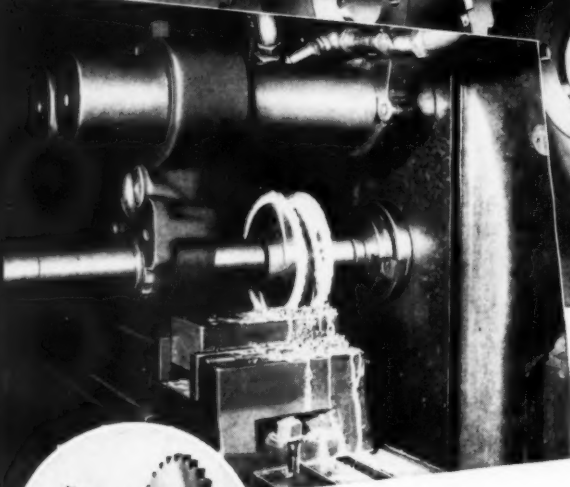
Here Come **MOTCH & MERRYWEATHER**  
*Slitting Saw Blades*

for Milling Applications

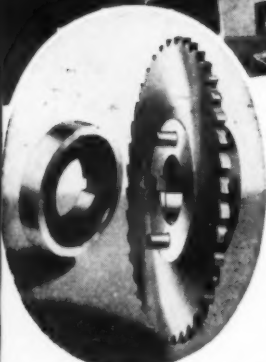
... WITH WELL KNOWN **TRIPLE-CHIP**  
**EFFICIENCY**  
and-

*3 Other  
Blades  
Advantages*

**DUAL DRIVE  
ADAPTATION  
•  
RANGE OF PITCH  
•  
INTERCHANGEABILITY**



Motch & Merryweather Slitting Saw Blades bring you all the advantages of Triple-Chip cutting: record-breaking speeds, low cost operation, long life, inexpensive sharpening. Also, dual drive pin construction, which provides positive driving properties, eliminating blade breakage caused by the former keyway drive. Also, range of pitch, in that three standard tooth spacings in all diameters and thicknesses permit selection to fit various types of work. Also, interchangeability, since standard size center hole and dual drive enable blades to fit  $1\frac{1}{4}$ " diameter arbors or smaller, thus reducing your blade inventory. Other proven features, too, make Motch & Merryweather Slitting Saw Blades worthy members of the widely known Triple-Chip line.



The Motch & Merryweather Dual Drive design, eliminating saw blade keyway drive, adds driving power and prevents breakage from keyway.

Get the whole story in our Bulletin "B-12",  
just off the press.

**THE MOTCH & MERRYWEATHER MACHINERY CO.**

PENTON BUILDING

CLEVELAND 13, OHIO



# AN ALL-PURPOSE BROACHING MACHINE

## That's What You Get With *American's 3-Way*

A machine that gives you pull down, push down, and surface broaching; a machine that can be used for a wide variety of internal and surface broaching jobs—that's American's exclusive 3-Way Vertical Hydraulic Broaching Machine. You can change over from one type of broaching operation to another quickly. It requires only replacement of fixture and broaches, and addition of pull head and lugs.

For all types of broaching machines, for all kinds and sizes of broaches, for tooling and fixture design based on more than a quarter century of broaching experience—look to American, the one source for all your broaching needs. For the best in broaching—machines, tools, and engineering—see American first!



To illustrate the wide variety of broaching jobs possible on this all-purpose machine, the Standard T-8-24 is pictured above.

This machine is operated by manual controls and the broach tool is mounted directly on the main machine slide. The operation is surface broaching the teeth in a round bar with the tooling designed to automatically clamp and eject the broached parts.

For broaching the holes in laminated commutator parts an American T-8-24 3-Way machine equipped with special broach retriever unit, foot switch, and electric controls was provided.

With the above extra equipment the operation is semi-automatic. Operator loads two parts and starts retriever unit, which lowers broach pilots through work into automatic quick connecting pull heads. Machine slide pulls broaches through work, operator unloads and starts return of machine slide by foot switch. At end of return stroke he loads two more pieces and begins cycle again.

\* \* \*  
A new circular tells the complete story of American's Type-T 3-Way broaching machine. A letter or post card will bring it to you by return mail. Write today for Circular 100.

**ANN ARBOR, MICHIGAN**

**BROACHING MACHINES  
PRESSES  
BROACHING TOOLS  
SPECIAL MACHINERY**

# PRECISION MEASUREMENT



By  
**WARREN  
BAKER**

## Section II—Instrument Inspection, Concluded.

### Part 15—Measurement with Optical Flats: Inspection and Calibration of Gage Blocks.

In this final installment, in which we shall once more discuss inspection problems involving high accuracy and close tolerances, it may be well to recapitulate some of the points that have been stressed in earlier chapters:

In measuring gage blocks, or measuring to close tolerances with gage blocks, be sure of your wring. Place the blocks, or the blocks and the part under inspection, on an accurately flat surface, such as a high accuracy toolmaker's flat. In using optical flats for measurement, as is the case with all the problems in this installment, the best surface for your work is another optical flat. This may be of steel or, preferably for most of this work, of quartz or pyrex. Do the work in standard temperature of 68°F. and standard humidity.

Wring the gage blocks to the surface of the optical flat. A test for perfect wring, if you are using quartz or pyrex flats — and that's the reason these types are recommended — is to turn the flat over after the blocks have been wrung to it and place the assembly in ordinary light. If the wring is imperfect, a rainbow will appear. If the wring is good there will be no rainbow.

The preliminary material on the use

of optical flats for inspection procedures was published as part 3 of this series, in the September, 1946, Blue Book. The characteristics of the fringes, the dark bands that show in optical flat measurements, were given there, as were the methods of interpreting the patterns. In this installment, we shall be concerned with measurement by means of the fringes.

#### Inspection of Gage Blocks

To inspect gage blocks of the B or A grades, the inspector should have available a set of master blocks, the dimensions of which he knows to the nearest millionth of an inch. To inspect master blocks, in a large plant, he should have a set of grand master blocks, to be used for no other purpose. Since optical measurements cause little or no wear on the blocks, a set of grand master blocks, used only for inspection of master or laboratory sets, should last a lifetime with proper care.

The kind of block used for this work makes little difference. It may be steel, chrome plated, or carbide, as you choose. It may be either square or rectangular. The point is that it must be accurate and its accuracy must be known. For optical measurement, it is

better to use solid blocks, however. Those with holes in the center may cause confusion in reading the fringes.

### Calibrations

Suppose we wished to check the size of a much used A grade gage block. In Fig. 1, the suspected block is U, a master block is M. (The figure, of course, is highly exaggerated.) You will

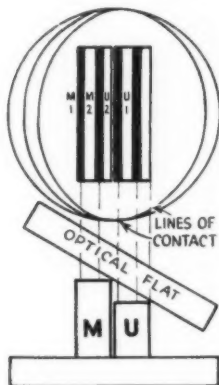


Fig. 1

note that there are two lines of contact, one for each block, because there is a sizable difference between their heights. However, both are reasonably flat and parallel. There are two fringes between the lines of contact. Therefore, Block M is two fringes higher than Block U. (Which one is higher is determined by rocking the flat, as detailed in part 3 and again in the following section on measuring cylinders.) Two fringes equals 23.2 micro-inches. So Block U has worn 0.000232".

It is much easier to determine the lines of contact if you can use blocks with different sized faces, as in Fig. 2. If you cannot, it is best to stagger the blocks; that is, let one extend past the

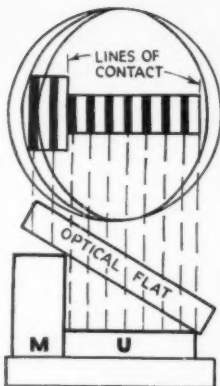


Fig. 2

other. Then your lines of contact will be readily separable. In this figure, the blocks again are parallel and flat, but Block M is seven full fringes higher than Block U. Seven times 11.6 is 81.2 micro-inches, or 0.0000812", the amount of difference in size.

In these two examples we have been measuring with the length of the blocks as a reference line. This is a good method when the heights are quite different. Now, let us consider some examples using the width as a reference line, a somewhat more common problem and one which gives patterns perhaps even more readily identifiable.

Fig. 3 shows that the two blocks, M and U, under comparison are flat and parallel. Remember that you can get this pattern by pushing down on the sides of the flat even though the blocks may not be of the same height, as shown just previously in Figs. 1 and 2. Using the width as the line of contact, however, it is obvious that if M is higher than U, the fringes from the surface of U will not be the same distance apart as those of M and they may not be directly opposite. To make sure,

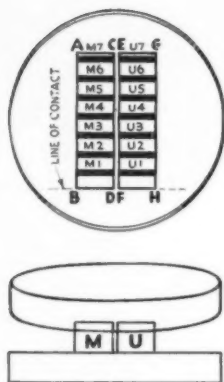


Fig. 3

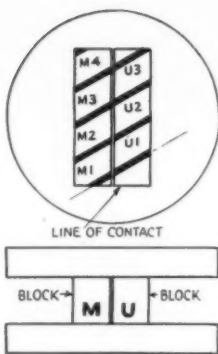


Fig. 4

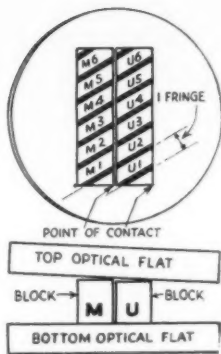


Fig. 5

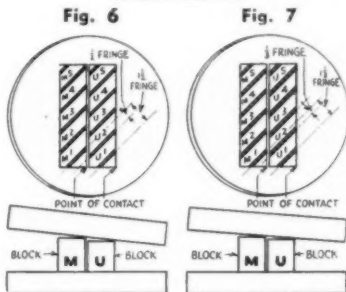
prod the flat about a bit until the fringes run diagonally, as in Fig. 4. If the fringes of M still line up with those of U, as shown, then the two blocks are not only parallel, but the same height.

Now, if it should occur, when you prod the optical flat around to get diagonal fringes for proof that the blocks are the same height, the diagonals are not in the same numerical order and do not line up, the blocks are not the same height. How to discover their difference is shown graphically in Figs. 5, 6 and 7.

You will note that in Fig. 5 even the line of contact has changed. Instead of being at the line BDFH, it is now at the points D and H. Since a segment of fringe appears first on U, this is the low block. So you run an imaginary line through the first fringe of the high block, (the imaginary line happens in this case to correspond with the second fringe of U), and count the number of fringes between this line and the center of the first part fringe that appears. Multiply this number by 11.6, and you have the difference in height in micro-inches. In more involved pat-

terns it may be found necessary to measure from the imaginary line to the point of contact, instead of the first fringe segment, then subtract one fringe before multiplying by 11.6

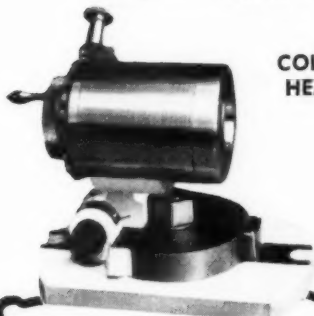
A pattern such as shown in Fig. 6 might give grave doubt of parallelism as well as height, but the parallelism is reserved for a later test. The height difference, which is quite obvious because the fringes are not only farther apart but do not even line up, is measured by the same method as that outlined for Fig. 5. Here the difference is  $1\frac{1}{2}$  fringes, or 17.4 micro-inches. In Fig. 7 the difference is  $2\frac{1}{3}$  fringes, so



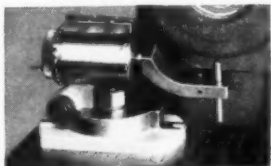


## GIVE YOUR TOOL ROOM A MATCO CHRISTMAS PRESENT

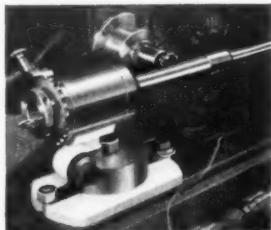
**COLLET HEAD** for precision milling and grinding angles, flats, tapers, hexagons, keyways. Attachments available for radius and angle wheel dressing, sharpening end mills and milling cutters, and for use on cylindrical grinders. Takes up to 1" capacity in ground thread collets. Base 4 $\frac{3}{4}$ " x 7 $\frac{1}{2}$ ". Height 5 $\frac{3}{4}$ ". Weight 21 lbs.



**COLLET  
HEAD**



**RADIUS DRESSER** for radii to 1 $\frac{1}{4}$ " circle. Quick-setting diamond adjuster. \$28.00.

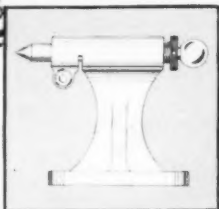


**KEYWAYS**—precision dividing head for light milling. Quick-indexing feature.

Representatives  
in territory  
will  
demonstrate  
without  
obligation



**LEVER ACTION COLLET CLOSER** makes collet head adaptable for production work. \$17.00.



**TAIL STOCK** gives added advantage for centering work. \$19.00.

**MATCO  
TOOL COMPANY**  
Est. 1934—Mfrs. complete line  
precision vises & wheel dressers  
2830-36 W. LAKE STREET  
CHICAGO 12 • ILLINOIS

**WRITE for  
CATALOG**

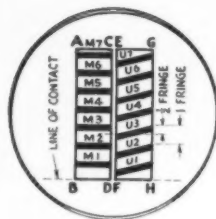


Fig. 8

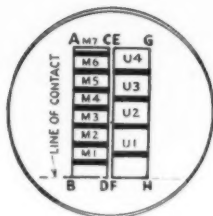


Fig. 9

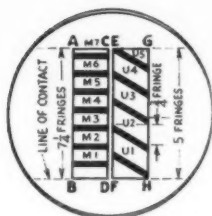


Fig. 10

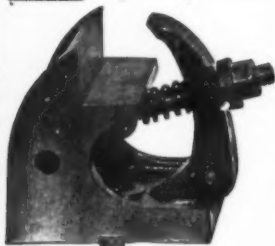
M is higher than U by 0.0000154".

#### To Test Parallelism

In the following examples, the known or master block is again M and the one under test is U. Since the M block

is now known to be parallel, make the top optical flat produce the pattern for flatness and parallelism shown at the left in Fig. 8. The line of contact, then, is BD, and it is immediately obvious

## HART MILLING FIXTURES



Size  $\frac{3}{4}$ "—Cap.  $\frac{1}{2}$ " to  $1\frac{1}{8}$ "  
 Size  $1\frac{1}{2}$ "—Cap.  $\frac{3}{4}$ " to  $1\frac{3}{4}$ "  
 Size  $2\frac{1}{2}$ "—Cap.  $1\frac{1}{4}$ " to  $2\frac{7}{8}$ "  
 Size 4"—Cap.  $2\frac{1}{2}$ " to 5"

### MASTERS OF A THOUSAND SET-UPS

Hart Milling Fixtures firmly hold any shape stock—Round, Hexagonal, Octagonal, or Square for machining, automatically aligning the stock with the machine. Fixtures may be set up in horizontal or vertical position. The grip holds the work on bottom as well as on back.

Hart Milling Fixtures have proved their efficiency in thousands of shops throughout the nation as well as abroad. They materially cut Jig and Fixture expense.

Made in 4 sizes for stock from  $\frac{1}{2}$  to 5 inches. Shipped in pairs unless otherwise ordered.

Write for more complete details

## HART MACHINE COMPANY

26 Mather Street

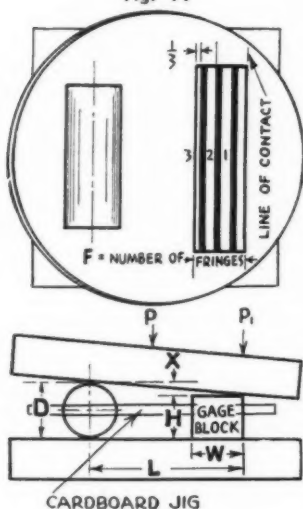
Dorchester - Boston 24,

Massachusetts

that block U is out of parallel with the master by half a fringe, or 5.8 millionths. But if you project your imaginary line from the center of M-1 or M-2 the GH edge of the block under test, you find the GH edge is the same height as the master. Since the fringe slants toward the line of contact, the edge EF is 5.8 micro-inches low.

In Fig. 9 the fringes are parallel across the width, so the surfaces are parallel across their width, but the wider spacing across block U shows the blocks are not parallel longitudinally. The problem is to find which end is higher and how much. Since the bands are wider on block U than they are on block M, block U must be higher at its upper, or EG, end because, from the rules given earlier, fringes spread to the high side from the line of contact; they compress to the low side from the line of contact. The difference in height in this case is quite simply arrived at by subtracting the number of bands

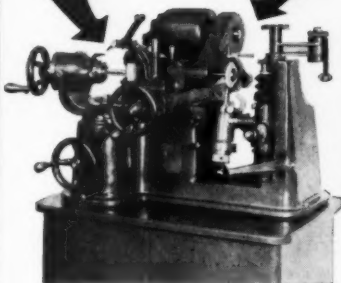
Fig. 11



## THE New MODEL 1100 HYBCO TAP GRINDER

ACCURATELY GRINDS  
CHAMFERS OF TAPS,  
CORE DRILLS

SHARPENS FLUTES,  
SPIRAL POINTS  
of TAPS



- Capacities No. 2 Mach. Screw to 1½" Hand Taps.
- All Settings Adjustable To Give Any Angle—Relief—Hook.
- Taps Held In Precision Collets Can Be Sharpened After Center Is Destroyed.
- Standard Motor—Any Current Specification.

*Representatives In Principal Cities*

**HENRY P. BOGGIS & CO.**

1279 West 3rd Street  
Cleveland 13, Ohio



## LONG TAPER STAMPS



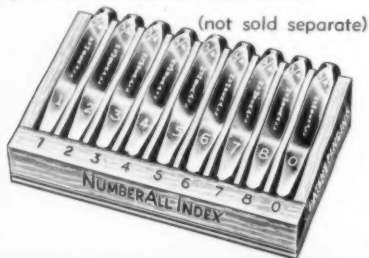
New Long Taper and Chamfered Corners for Locating Base of Letters and Aiding in Correct Spacing and Aligning • Steel Letters and Figures • Heavy Bevel • Heavy Stock • Tough Tool Steel • Deep Engraving •

Write for  
Bulletin BB 15

## PIK QUIK STAMP INDEX STAND

(Patent Pending)

Designed to speed up your Marking. Any character is quickly picked up and replaced in the Index Stand, keeping the stamps in perfect order. Our stamp prices up to 1/4" include an Index Stand.



(not sold separate)

**NUMBERALL STAMP & TOOL CO.**  
HUGUENOT PARK STATEN ISLAND 12, N. Y.

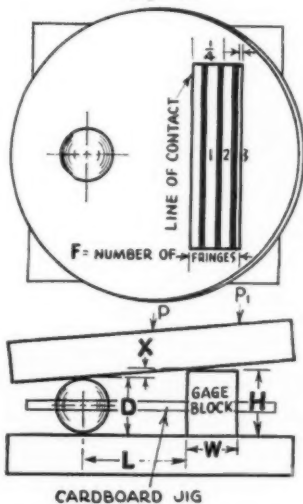
on U from the number on M and multiplying the difference by 11.6; in this case, 26.1 micro-inches.

In Fig. 10 we have a problem which combines both those conditions last considered. Contact is still the line BD, and if you follow through the tests explained for Fig. 8 and 9 you will see that this time it is the GH edge that is low, because the lines slant that way; the end EG again is high, as proved by the wider spacing of the bands on the surface of that block, and the difference in height is 8.7 micro-inches along the GH line and 26.1 micro-inches along the EG line.

### Parallelism of Master

To be sure the master block is parallel, turn either block end for end and if the same fringe pattern appears you know the master is parallel. All sorts of patterns can be obtained by prodding the top flat and getting different lines of contact. If you follow the lines of

Fig. 12



# *Special* **CARBIDE TOOL GRINDER**

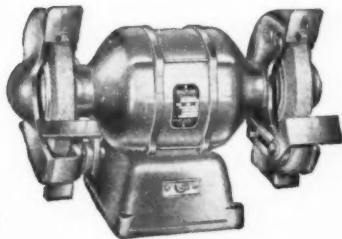


## **FOR QUICKLY AND ACCURATELY SHARPENING CARBIDE TOOLS**

BALDOR GRINDER, series 500, (shown above) is the newest development in grinders designed and fully equipped for sharpening Carbide Tools quickly and accurately; has sturdy  $\frac{1}{2}$  H.P., reversible, ball-bearing motor. 6" Silicon Carbide wheels; adjustable tool-rest tables, water pot. Complete as illustrated and GAURANTEED 2 YEARS against burn-out.

**Reasonably Prompt Shipment**

**ASK FOR BALDOR BULLETIN 321C ON COMPLETE LINE**



**BALDOR Bench Grinder  
8100 Series**

AT LEFT: BALDOR Grinder, 8100 series. 8" Aloxite wheels; ball-bearing motor;  $\frac{1}{2}$  h.p., (1700 rpm.) and  $\frac{3}{4}$  h.p., (3400 rpm); 1-phase, 3-phase or D. C.

**BALDOR ELECTRIC COMPANY**  
4368 Duncan Ave., ST. LOUIS 10, MO.

*District Offices in Principal Cities*

**BALDOR**  
BALL BEARING **GRINDERS**

contact shown in these examples, however, your readings and interpretations will be correct.

The same methods of determining parallelism apply to master parallels and all other instruments of this type.

### Measuring Cylinder or Ball

In Fig. 11 we have a plug gage and a gage block to which its diameter is to be compared. First, we must find which is larger. Press the optical flat first near the center at the point marked P to insure firm contact. Then press at P<sub>1</sub>. If the spacing remains the same this time, the plug is larger than the block. If the fringes broaden, or tend to disappear, then the plug is smaller. In this case the plug is larger. Note the cardboard jig. While not essential, it helps handle such objects under the optical flat.

From the figure, you will note that W is the width of the gage block. L is the distance from the contact edge of the gage block to the longitudinal axis of the cylinder. If you will make L an

even multiple of W, by means of the jig, your computations will be greatly simplified.

### The General Formula

Here is the formula for all cylindrical and spherical objects:

$$X = \frac{11.6FL}{W}$$

where X is the difference in height and F is the number of fringes. It is apparent that D, the diameter of the ball, roll, plug, or cylinder, equals H plus X if the block is lower and H minus X if the block is higher.

Let's say that in Fig. 11 the plug gage has a nominal diameter of 0.300". W is 0.375, L is 1.125 (three times that of W), H is 0.300 and F, the number of fringes is 3-1/3. Then  $X = 11.6 \times 3\frac{1}{3} \times 1.125$ , divided by .375, or 116 micro-inches. D equals .300 plus 0.000116, or 0.300116".

In Fig. 12 the same problem applies to a ball. This time let's say that the ball has a nominal diameter of 0.500". W is 0.375; L is 0.750 (twice W); H is 0.500 and F is 3 1/4. X, then is 75.4

Fig. 13

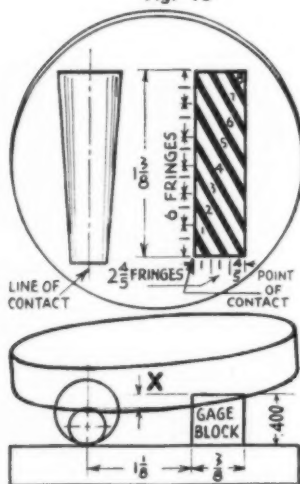
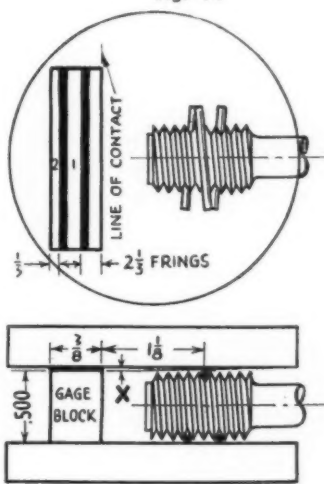


Fig. 14



micro-inches, and, because the ball is smaller,  $D$  is 0.500 minus 0.0000754" or 0.4999246".

### Measuring Tapered Objects

From the foregoing you know that if there is a taper in the object under test, the fringe pattern will be similar to that shown in Fig. 13. The line of contact is along the axis of the tapered object and one point of the gage block. Applying the same formulas used previously, count fringes along the small end of the block and you find there are 2-4/5. Then by the formula for cylinder and ball, you find  $X = 11.6 \times 2-4/5 \times 1.125$ , divided by .375, or 97.44 micro-inches. So the diameter of the small end of the taper is 0.400 minus 0.00009744, or 0.39990256".

There are, of course, many means and formulae for measuring taper, but here is a simple one, while you are using optical flats to measure the small

diameter, to measure the amount of taper per inch as well:

The taper per inch is equal to the number of fringes along the edge of the block times 11.6, divided by the length of the block. So, in Fig. 13, taper per inch is 6 times 11.6 divided by 1.375, or 0.00005062".

### Measuring Threads

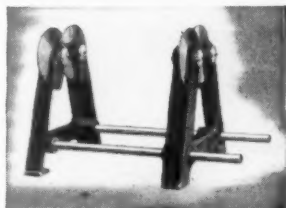
In Fig. 14 it is assumed that you know the nominal diameter of the thread gage shown and have found the nominal pitch diameter. Also that you know the best wire size and the nominal measurement over the wires. These matters were discussed in detail in Part 13 of this series.

Set up gage blocks of the size of the nominal measurement over the wires and wring them to the bottom optical flat. Set up the thread gage and wires as shown in the figure, then place the top flat over them. First determine

## If you handle Rotating Parts

If your shop handles rotating parts these sturdy and dependable balancing ways would be highly profitable equipment to use. In accurate balancing and truing operations they save time, labor and money. No leveling required.

Four chilled iron disc rotate with minimum friction on sensitive special bearings, giving a quick, accurate indication of whether or not the work is in perfect balance.



**ANDERSON BALANCING WAYS**

Swing	Distance Between Standards	Capacity in lbs.
20 in.	20 in.	1,000
40 in.	30 in.	2,000
60 in.	30 in.	2,000
72 in.	66 in.	5,000
96 in.	88 in.	10,000



Write for Bulletin No. 12-5

**ANDERSON BROS. MFG. CO., Rockford, Ill.**

Balancing Ways, Roto Checkers, Hand and Power Scrapers, Spotters, Hand and Power Hydraulic Straightening Presses.

by the pressure method whether the thread gage is smaller or larger than the blocks, then calculate in the same manner as explained for a cylinder or ball. This difference is added to or subtracted from the nominal pitch diameter to find the actual pitch diameter of the gage. In the figure, certain values have been assumed, so by substituting in the formula, we find  $X = 11.6 \times 2\frac{1}{3} \times 1.25$ , divided by .375, or 81.2 micro-inches. Since the gage is smaller than the blocks, the height over the wires is 0.500 minus 0.0000812, or 0.4999188".

In Fig. 15 you see the setup of gage blocks and center points for measuring odd fluted taps.  $F$  = the number of fringes that show on the reference gage block.

$$\text{Then, } Z = 11.6 FL$$

$$Y = H + Z$$

$$X = \text{Height marked on gage blocks and center points and } M = Y - X.$$

$$2$$

The setup in Fig. 15 is the same as that shown for a five-fluted tap in the last installment. The formulas given here apply to the measurement of all odd-fluted taps.

### Measuring Worn Anvils

Micrometer anvils often present the

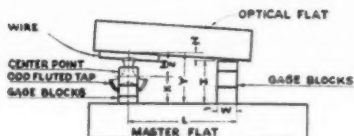


Fig. 15

inspector with some of his commonest problems. If you will hark back to 5, 10 and 11 in part 3, you will have the pattern most often shown by anvil wear. Once concavity or convexity is established, all you have to do is count the rings, multiply by 11.6, and you have the amount of wear in micro-inches.

### Checking Optical Flats

Three optical flats can be checked against themselves and the amount and sign of the error in flatness in each flat determined.

The flats are set up successively as shown in Fig. 16 A, B, and C and the error is recorded in each case as follows:

$$A + B = +1/4 \text{ fringe} = 1/4 X \text{ } 11.6 = +2.9 \text{ microinches}$$

$$B + C = -1/6 \text{ fringe} = -1/6 X \text{ } 11.6 = -1.93 \text{ microinches}$$

$$A + C = +1/8 \text{ fringe} = +1/8 X \text{ } 11.6 = 1.45 \text{ microinches}$$

Solving the equations:

$$A + B = +2.9 \text{ microinches}$$

$$B + C = -1.93 \text{ microinches}$$

$$A - C = +4.83 \text{ microinches}$$

**ALUMINUM**

# CASTINGS

QUALITY, APPEARANCE & PRICE

*Write or Phone*

**ARCANUM ALUMINUM FDY.**

**8430 Grand River Ave.**

**TY 7-6733, Detroit 4, Mich.**

## Lassy SINE BAR

Hardened & stabilized. Both sides square & parallel to work surface. Allows attaching to angle plate.

The one sure way to locate and check work fast and accurately when an angle is involved.

Price in case Lapped finish **\$28.00**

Send for circular

**LASSY TOOL CO**  
PLAINVILLE, CONN.

GUARANTEED ACCURACY

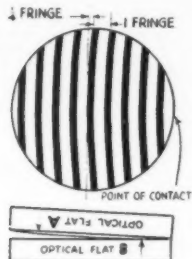


Fig. 16A

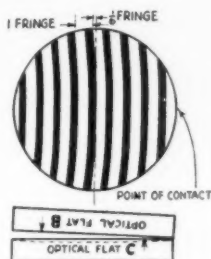


Fig. 16B

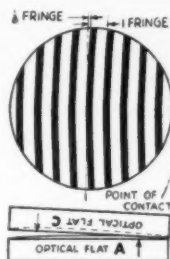


Fig. 16C

$$A + C = +1.45 \text{ microinches}$$

$$2A = +6.28$$

$$A = +3.14 \text{ microinches}$$

$$3.14 + B = +2.90 \text{ microinches}$$

$$B = -0.24 \text{ microinches}$$

$$-0.24 + C = -1.93 \text{ microinches}$$

$$C = -1.71 \text{ microinches}$$

Since the plus sign show convexity and the minus sign concavity, it is evident that:

Optical Flat "A" is 3.14 microinches high in the center.

Flat "B" is 0.24 microinches low in the center.

Flat "C" is 1.71 microinches low in the center.

All illustrations courtesy the Do-All Company, Des Plaines, Illinois. The author wishes to thank the DoAll Company for permission to use in this installment much material prepared under the title "Science of Measurement", Book 6, and published by the DoAll Trade School.

#### CLEVELAND DIE CASTING MACHINES

The Cleveland Automatic Machine Company are presenting three new bulletins for distribution. One is a 6-page bulletin which illustrates and describes the 2½" Model AB Cleveland "Diamatic." This is a single spindle, five hole turret, automatic equipped with an electric feed drive and can be used either as a bar machine or a chucker.

The second is a 4-page bulletin which gives full details and specifications of the improved Model No. 400 Cleveland, High-Pressure Hydraulic, Universal Diecasting Machine.

The third is a 2-page bulletin which announces the New Model No. 200 Cleveland Universal Diecasting Machine. This has 27" x 27" die plates. The Cleveland Automatic Machine Co., Dept. BB, Cincinnati 12, Ohio.

#### HEAT FOR METALS

A 32 page booklet entitled, "Heat for Metals," published by Surface Combustion Corp., Toledo 1, Ohio, includes the latest developments in heating equipment for steel mills, the history of the

development of gas chemistry and heat treatment; prepared gas atmospheres and heating equipment applications to processing such as gas carburizing, carbon restoration, atmosphere hardening, and gas normalizing and annealing. Request on company letterhead.

#### AMERICAN BROACHES AND PRESSES

American Broach & Machine Company are announcing the publication of two circulars. One is a 12-page circular, No. 300, describing their single ram, single dual and duplex surface broaching machines. This circular contains photographs of actual broaching operations and machine features and has complete machine specifications for every model.

The other is a 1-page, 2-sided circular, No. 202, illustrating their V1-2 ton press which has been redesigned to provide more work space between the ram and work table. This machine is used for arbor press work, assembly work, straightening and push broaching operations. American Broach & Machine Co., Dept. BB, Ann Arbor, Mich.

# SHELDON

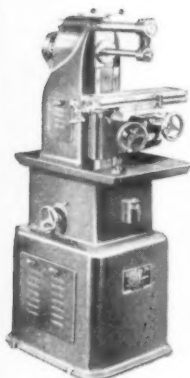
**makes ALL THREE!**

These 3 precision machine tools are a necessary part of every completely tooled shop . . . a modern precision lathe with "Zero Precision" tapered roller bearings that will retain its extreme accuracy at new high operating speeds . . . a convenient back-geared shaper that embodies all major design improvements . . . a capable small milling machine that will do accurate work . . . all three are extremely moderate in price.

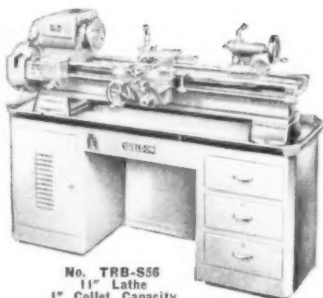
*Write for Bulletins*

## SHELDON MACHINE CO. Inc.

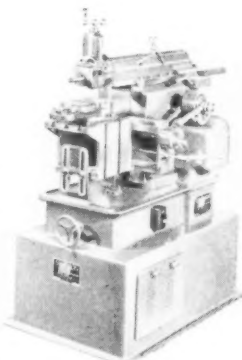
*Manufacturers of Sheldon Precision Lathes • Milling Machines • Shapers*  
4242 N. KNOX AVENUE • CHICAGO 40, ILLINOIS, U. S. A.



No. 3000A  
Size "0"  
Milling Machine



No. TRB-S56  
11" Lathe  
1" Collet Capacity



No. 8000  
12" Shaper

# WHAT'S NEW IN METALWORKING

## RATIOBAR OF GORTON MODEL P13 3-DIMENSIONAL PANTOGRAPH ALIGNS PIVOT CENTER, CUTTER SPINDLE AND TRACING STYLE

In developing the P13, a fundamental improvement in design was made to simplify the operation of the machine. The Gorton Ratiobar, supported at either end by a precision-balanced overarm, aligns the pivot center, cutter spindle and tracing style in an absolutely straight line.

There is only one slider block in the Ratiobar to adjust for whatever reduction is desired; chance for error is greatly reduced. The Ratiobar is an aluminum alloy casting pivoted horizontally, on which are mounted two hardened and ground steel tracks. The tracer style and cutter spindle float on precision ball bearings which travel in these tracks.

The Ratiobar carries the weight of the entire pantograph mechanism, rather than having the weight carried by the pantograph linkages themselves. As the tracer moves out and away from the pivot center, the pantograph linkages move toward it, thereby maintaining a better balance than if the linkages were to move out with the tracing style.

The Model P13 pantograph conforms to the requirements of producers of small, intricate dies, molds, stamps, and hobs, as well as performing the conventional type of work of light pantograph machines.

This 3-dimensional machine employs an enlarged 3-dimensional Master, or pattern, which is mounted on the copy

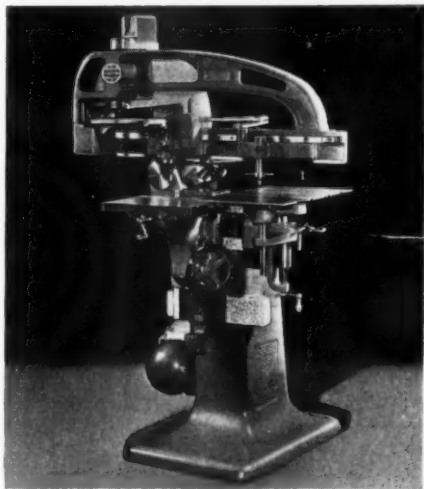


table. The surface of this Master is traced in three dimensions manually with the tracing style while the cutter reproduces at the desired ratio of reduction on the work piece all of the angles, curves, and surfaces of the Master.

Different sizes are produced from the same Master by changing the Pantograph ratio, or by changing the tracing style and cutter sizes. Ratios from 2 to 1 to 40 to 1 are obtainable. The pantograph bar is graduated for reductions of 1:2, 1:3, 1:4, 1:6, 1:8, 1:12, and 1:16. Other reductions are readily adjusted, since only

# NEW PLASTIC FLOOR PATCH

**Sets Instantly!**



## Tamp Smooth! Truck Over!

No longer is it necessary for the busy plant to close off an area of concrete floor while waiting for newly installed patches to set. Flexrock offers a new plastic repair material which is ready for traffic almost the moment it's put down. Simply shovel **INSTANT-USE** into the hole or rut — tamp — and your floor is restored to solid smoothness . . . back in service without delay. Tough **INSTANT-USE** bonds tight to old concrete, makes long-lasting heavy duty patch. Withstands extreme loads. Keep a drum on hand for emergencies. Immediate shipment.



Request Descriptive  
Folder and Details  
of  
**FREE TRIAL OFFER**



## INSTANT-USE

### FLEXROCK Co.,

3634 Filbert St., Philadelphia 4, Pa.  
Canadian Off.: 21 King St., E., Toronto, Ont.

Please send me complete **INSTANT-USE**  
information . . . details of **TRIAL ORDER**  
**PLAN**—no obligation.

Name.....

Company.....

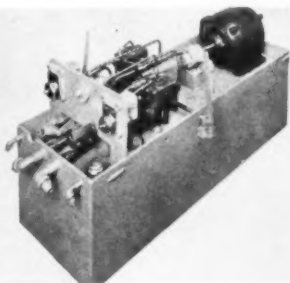
Address.....

one sliding adjustment is necessary. For enlarging work, one merely removes the tracing style and cutter spindle assemblies, and reverses their positions.

The cutter spindle feed of the unit is 5/16", with a corresponding cutter spindle collet size of 5/16". The longitudinal feed of the work table is 10"; the cross feed, with work up to 3/4" thick, is 5"; work over 3/4" thick, cross feed is 2 7/8". The vertical feed of the work table is 9 3/4". The work table measures 8" x 12" in size. Maximum distance from the spindle nose to the table top is 9 3/4". The unit is equipped with six spindle speeds, of from 4560 to 1800 rpm. The George Gorton Machine Co., Dept. BB, Racine, Wis.

## HUFFORD HYDRAULIC POWER UNIT

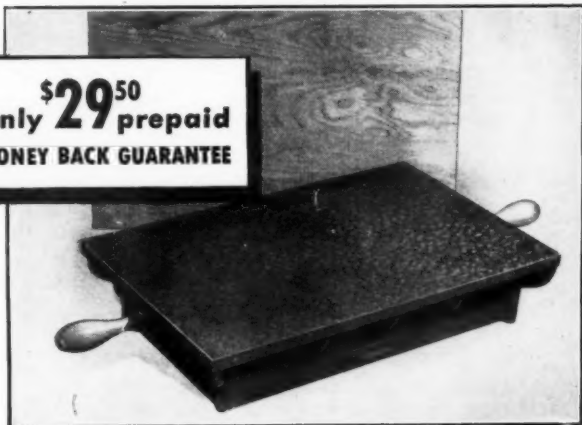
Built for activating any hydraulically driven machinery, a new hydraulic power unit is announced by Hufford Machine Works, Redondo Beach, Calif. The unit is completely self-contained with motor, pump, valves and flow controls mounted above the hydraulic fluid reservoir and filter system. A cover encloses the entire unit, preventing entrance of dust and foreign matter. Built-in selector valves enable both forward and reverse motion of the machine to which the power unit is applied and the meter flow controls permit speed of the driven mechanism to be varied over a wide range. The unit, is suitable for both manual and automatic operations.



Hufford power units are regularly available in sizes from 1 to 50 h.p., or larger if required, and can be furnished in a variety of types from a simple motor-driven pump to complicated systems for all-automatic operation.

# War Surplus SURFACE PLATES

**\$29<sup>50</sup>**  
**Only prepaid**  
**MONEY BACK GUARANTEE**



Precision surface plates. Finest quality Hand Scraped. Manufactured by CHALLENGE MACH. CO. Original factory packing. 12"x18" with 1/2" thick plate. 3" ribs. Complete with durable wooden protective cover and wooden handles. Made to strict gov't. specifications. BRAND NEW! A buy you can't afford to miss.

**ONLY WAR SURPLUS CAN BRING YOU SUCH ITEMS AT LOWEST PRICES. WE HAVE MANY SURPLUS MACHINERY ITEMS. WE CAN SAVE YOU MONEY IF YOU'LL ADVISE US OF YOUR NEEDS. WE BUY IN TREMENDOUS QUANTITIES AND PASS THE SAVINGS ON TO YOU!**

Quantity Discounts On All Items.

## ANOTHER SURPLUS BARGAIN!

\*Oxygen Regulators—HARRIS CALORIFIC. 400-3,000 lb. gauges.

\*Acetylene Regulators—ALEXANDER MILBURN. 50-500 lb. gauges, commercial fitting.

Above at ONLY \$17. Pr. or \$9. Ea.

\*Rego Acetylene Regulators—50-500 lb. gauges, commercial fitting, \$9.50 Ea.

\*Rego Hydrogen Regulators—50-3,000 lb. gauges, \$9.50 Ea.

10 DAYS NET TO RATED ACCOUNTS • ORDER BY MAIL

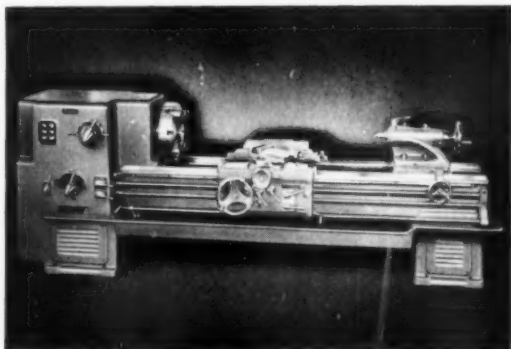
SEND CHECK OR MONEY ORDER.

All Prices F.O.B. Denver, Colorado

**ASSOCIATED TRADERS, INC.**  
255 Kalamath Street Denver, Colorado

## NEW SIDNEY ENGINE LATHE PROVIDES SIXTY FEED AND THREAD CHANGES

Illustrated is the new 18" 32-speed Sidney Engine Lathe being manufactured by The Sidney Machine Tool Co. This lathe is equipped with an all-herringbone geared headstock with 32 pre-selected spindle speeds. Spindle and long intermediate shafts are supported by anti-friction center bearings in addition to the conventional end bearing mounting. Standard spindle bore is 1 13/16" and can be increased to 3 3/4" without affecting the working parts of the headstock. The machine can be furnished with a standard speed range of from 13 to 1000 RPM or an optional high range from 19 to 1500 RPM. Spindle is mounted in such a manner to compensate automatically for expansion caused by temperature rise. This transmission design is unique in

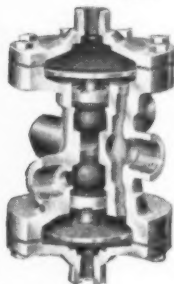


that the 32 spindle speed changes are made available through the use of only 16 herringbone gears.

The gear box is totally enclosed with all moving parts running in oil. Sixty changes of feeds from .0028 to .174 and

## CRESCENT AIR VALVES

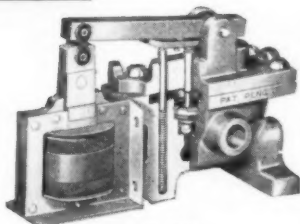
Crescent Air Valves are sturdy, compact, fast-acting. Designed for the continuous operation of single and double acting air cylinders. Abnormally large volume output. May be operated at any speed of practical value. Both models shown have completed over 20 million cycles without leaks or repairs. Tested for pressures up to 140 psi.



**MODEL 12**

**Four-Way, Diaphragm Actuated, Pilot Controlled**

Tough, oil-resistant rubber diaphragms and ball valves. Bronze body and seats. Made in 1/2" size only, but with large volume . . . Couples directly into pipe line connecting cylinder heads.



**MODEL 24S**

**Four-Way, Lever Actuated, Solenoid Controlled . . .**

Stainless steel ball Valves. Bronze body and seats . . . Made in 1/4" size only, but may be used in place of many conventional 3/8" valves due to large volume output. Available for manual control.

## CRESCENT VALVE COMPANY

**6073 State St.,**

**Huntington Park E-1, Calif.**

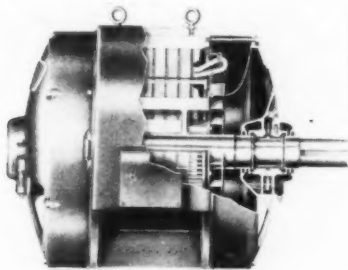
sixty changes of threads from 1½ to 92 are obtained by means of a convenient dial control.

The heavy duty apron is of double wall construction with all shafts rotating on anti-friction bearings. Lubrication is entirely automatic from centrally located pump and reservoir. The lathe bed is cast of a steel-nickel-gray iron mixture and is exceptionally rugged, designed with the four longitudinal walls and double cross girts spaced at 12 inch intervals.

The simple contour of this lathe produces not only an attractive appearance, but also provides plain surfaces for easy cleaning. Complete information regarding this new unit is available by writing to The Sidney Machine Tool Co., Dept. BB, Sidney, Ohio.

#### HEAVY-DUTY SQUIRREL-CAGE INDUCTION MOTORS ARE SPLASH-PROOF

Heavy-duty squirrel-cage induction motors for large-power drives from 100 to 1000 H.P., 1800 rpm, and lower speeds answer the demand for motors of drip and splash-proof construction. A fabricated steel frame shuts out foreign particles, keeps operation quieter, and simplifies cleaning. Access plates designed for speedy removal and replacement on the larger ratings facilitate inspection and cleaning. Sealed bearings can be cleaned and refilled without motor dismantling. Double end ventilation of the unit is provided by a blower on



each end of the rotor. Starting characteristics are NEMA Class B (normal torque, low starting current), for across-the-line starting.

Complete specifications on the new motors are available by writing to The Electric Machinery Manufacturing Co., Dept BB, 821 Second Ave., S. E., Minneapolis, Minn.

#### There's an Easier Way!



#### to Solve LEAD HAMMER BOTTLENECKS!



#### DO IT WITH THE NEW COOK 3 IN 1 LEAD HAMMER MOLD!

It's a production hammer mold . . . makes three lead hammers as fast as ordinary molds make one!

It's expressly designed to mold hammer heads in 3, 4, 5 or 6 lb. sizes around COOK SHUR-GRIP HAMMER HANDLES . . . the drop forged handles that mean certain safety!

It's easy to use! Close lid . . . pour lead directly from lead pot or ladle and THREE hammers are molded!

Try it . . . The COOK 3-in-1. Production Lead Hammer Mold!

Address Dept. "7" for complete lead hammer service literature and price list!

#### LAWRENCE H. COOK, INC.

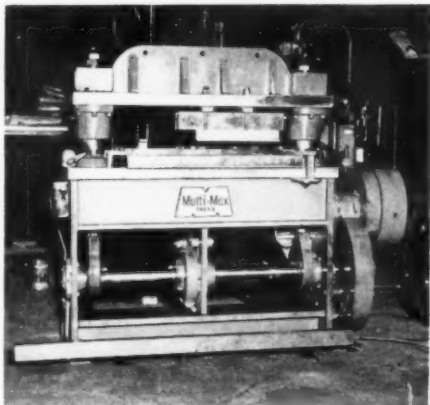
Successors To The Johnson Tool Co.  
65 MASSAHOIT AVE., EAST PROVIDENCE 14, R. I.  
PLASTIC MOLDS AND TOOLS

## PARKER COMBINATION SHEAR AND PRESS BOASTS VERSATILITY

Parker Manufacturing Co. Santa Monica, Calif., is now making delivery on a new, 30-ton combination shear and press known as the Multi-Max Press. Designed by Harold Verson, formerly Chief Engineer of the Verson Allsteel Press Co., of Chicago, the Multi-Max is claimed to be versatile. Mechanically operated, it shears, blanks, notches, punches perforates, slots, pierces, lances, bends and forms sheet metal parts in single or multiple units, with one operator.

The press needs no special foundation, has no overhanging parts, and requires only 36"x75" floor space. Because of its compact size, it is easily portable. Finished parts are fabricated at the point of assembly in required amounts, thus saving long runs, large inventories of parts, handling and stacking costs and floor space for storage. It was designed primarily for this "plug-in" advantage.

The Multi-Max is of all steel plate welded construction, normalized after

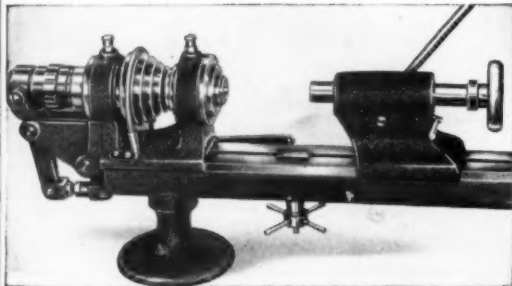


welding to relieve all stresses. Stroke is 2", as is the ram adjustment. Shut height is 10". The stroke is down, the adjustment up. Bed die space is 12"x36"; ram die space is 10"x36". Bed opening, 5"x32".

# DERBYSHIRE

*Fine Precision  
Instrument*

# LATHES



## FOR INSTRUMENT AND WATCHMAKING

- THREAD CUTTING
- CENTERING
- TURNING
- GRINDING
- DRILLING
- REAMING
- FORMING
- MILLING

• Illustrated • CAPACITY .315" • BED 12" • SWING 3.94"  
MAGNUS BALL-BEARING LATHE • COMBINATION TAILSTOCK  
SPRING-BIND COLLET CLOSER ATTACHMENT.

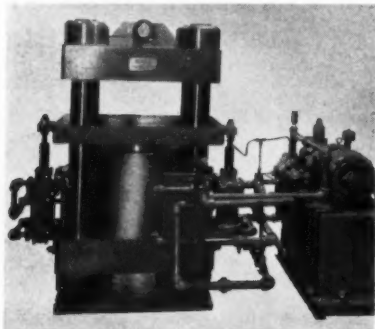
**F. W. DERBYSHIRE, INC., WALTHAM 54, MASSACHUSETTS**

A 1½ HP, 3 phase motor is furnished capable of producing 100 strokes per minute. Bed is 32" from floor, overall height is 57". Shipping weight is 3250 lbs. approx. With proper sets of dies, combination shearing, blanking, punching and forming operations are economically performed with one operator for long production or short fill-in runs.

#### **SCHILL 400-TON HYDRAULIC DIE-HOBGING PRESS**

A new 4-rod Hydraulic Press of all-steel construction has recently been completed by the firm of Edward Franklin Schill. The unit has a stroke of 6½", with a daylight opening of 12; the clearance between the strain rods is 22" right and left by 8" front to back. The stroke control is from ¾" to a full stroke of 6½", and pressure control is up to the 400-ton capacity of the press. The cylinder is of forged steel, the up-moving ram of close grain, gray iron, 16" in diameter.

Upmoving platen bearings are bushed with hard bronze liners, closely fitted to the strain rods. The top platen and moving platen are both fitted with tool steel, hardened and ground to receive the pressure of the work. The platens are of extra thickness to avoid deflection under full pressure. The cylinder walls are also built of extra thickness, in order to prevent outward weave.



The hydraulic unit is operated by a 7½ HP motor. The unit is manually operated, with a free closing speed of 75" per minute, and 150" per minute opening speed. For further details, write to Edward Franklin Schill, Dept. BB, 39 Cortlandt St., New York 7, N. Y.

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

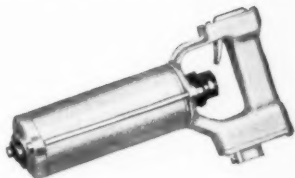
**Overtime Installation  
and Maintenance Work  
Doesn't Come Cheap!**

**BUT—**

***SYNTRON***

**DEPENDABLE**

**ELECTRIC  
HAMMERS**



**Will cut costs and time when  
those overtime jobs include—**

**Drilling, Cutting  
and Chipping in  
Concrete and  
Masonry**

***Write for illustrated  
folder.***

**SYNTRON CO.**

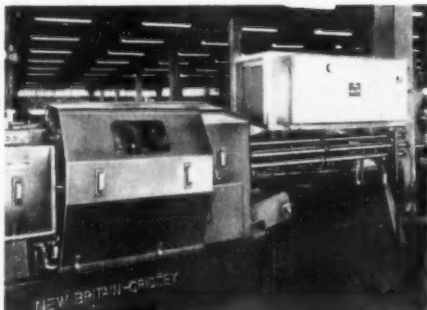
**300 Lexington, Homer City, Pa.**

## COOLANT TEMPERATURE CONTROL UNIT FOR MULTIPLE SPINDLE AUTOMATICS

Niagara Blower Co. has produced a Coolant Temperature Control Unit for application to New Britain-Gridley Automatic Screw Machines. The new unit increases production by eliminating warm-up operations and subsequent tool adjustments as well as preventing variations in the machine work caused by temperatures rising during operating periods.

When the screw machine is operating the coolant is kept at a pre-determined temperature by the constant evaporation of moisture on the outside of tubes through which the hot coolant oil is flowing. This method removes 1000 BTU per lb. of water evaporated.

When the machine is stopped, a fall in the coolant temperature is prevented by the automatic operation of an electric element, which is also used for pre-heating after a longer shut-down period. Whether the machine is running at high speed, or stopped, or remains idle over night, the temperature of the coolant is always within 2 or 3 degrees of a pre-



determined point, effectively preventing harmful contraction or expansion of working parts.

The unit can be adapted to all multiple spindle automatics. It is manufactured by Niagara Blower Co., 405 Lexington Ave., New York 17, and installed by New Britain-Gridley Division of the New Britain Machine Co., New Britain, Conn.

## Put Your Stop Watch

### on NICHOLSON EXPANDING MANDRELS

Test the time-saving possibilities of these widely used precision tools. Not infrequently, time studies show operations are completed in less time than



was formerly consumed in looking for or turning a solid arbor. Set of 14 does work of 209 solid

### BULLETIN 1043 SHOWS YOU HOW TO

*Save Set-Up Time • Promote Precision*

arbors. For all bores  $\frac{1}{2}$ " to 7". Hardened tool steel. Sold singly or in sets.

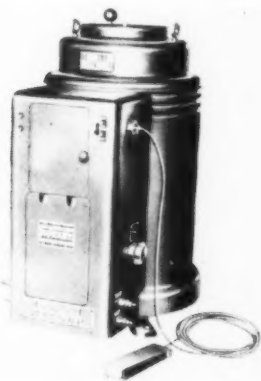
**W. H. NICHOLSON & CO., 117 Oregon St., Wilkes-Barre, Pa.**

Valves • Traps • Floats • Steam Specialties

## HOBART AC WELDER FOR "HELIARC" WELDING

The Hobart Bros. Co. has developed a new AC welder especially designed for use with modern "Heliarc" Equipment as supplied by The Linde Air Products Co., using helium or argon for Inert-Gas-Shielded Welding. This equipment is being widely adopted for welding magnesium alloys, aluminum, stainless steels, high carbon and other alloy steels, brass, Monel, Everdur, and other hard-to-weld metals.

In addition to standard AC welder features, the Model TIH-300-s, illustrated, is claimed to embody high frequency stabilization which insures easy starting and dependable maintenance of the gas-shielded arc with little rectification of the A.C. current passing through it. This insures sound welds of clean appearance, and reduces the amount of current drawn from the power lines by the transformer.



Pressing the foot pedal instantly starts the arc through the tungsten electrode, and simultaneously opens the valves permitting the shielding gas and the cooling water to flow through the special torch. Releasing the pedal breaks the arc, but permits gas and water to continue flowing for a predetermined length of time, which is adjustable up to 180 seconds. This delaying action protects the weld metal from oxidation until it has had time to solidify after the arc has been broken. Complete data: The Hobart Brothers Co., Dept. BB, Troy, O.



## DUB LIFE

### PLUG GAGES WITH COLORED PLASTIC

### COLLETS

(INSULATING)



RED for  
"NO GO"

GREEN  
for "GO"



## DUB LIFE

Remember! — Colored Collets instantly identify plugs. They are weight reducing, lock securely and will not mar the finest finish.

United Precision Plug Gages are scientifically designed. They are made by skilled craftsmen from the finest gage steels. The latest in modern equipment for metal working and heat treating assures a high standard of perfection—dependable accuracy, maximum service at minimum cost.



## UNITED PRECISION PRODUCTS CO.

SHABONNA, ILLINOIS



## The Standard of QUALITY

All standard sizes carried in stock for immediate delivery. Special cutters made to Blue Print.

As Cutter Specialists since 1919 we are able to offer the highest quality and service at attractive prices.

Write today for prices. Few Territories Open

**QUALITY TOOL WORKS**  
Market St., Waukegan, Illinois

## Immediate Delivery FROM STOCK

### GREAVES-SILENT BAKELITE GEARS



No waiting when you order Greaves Silent Bakelite Gears. • We have them in stock NOW! • Your order will go forward immediately. • You'll appreciate the silent operation and added smoothness provided by Greaves Silent Bakelite Gears. • You'll marvel at their great strength to carry big power loads... their remarkable ability to successfully operate completely submerged in water. • You'll welcome their low cost. • No metal reinforcements required. • Save Time... Money... Labor!

We also make silent gears of rawhide and Fabrol.

Write for Circular.

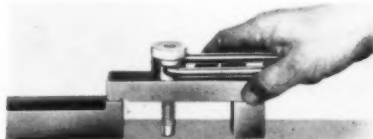


FOR CONCERNED  
BUYING THEIR OWN  
GEARS, WE CAN  
MAKE IMMEDIATE  
DELIVERY ON  
ORDERS SHIPPED TO  
SPECIFIED  
QUANTITY AND PRICE

**Greaves MACHINE TOOL CO.**  
2013-18 Eastern Ave.  
Cincinnati, Ohio

## NO TOOLS REQUIRED TO CLAMP JIG-NUTS IN POSITION

Developed for use with work holding fixtures or as part of conventional machine set ups, the Jig-Nut eliminates the need for wrenches or tools in clamping work pieces under strap clamps. Made to fit standard stud threads, this quick acting nut needs only to be screwed down finger tight and more than ample pressure is exerted by the cam action obtained by depressing the handle from vertical to horizontal. Among the advantages claimed are the ability to turn the handle to any position radially before depressing it; the self locking qualities make the clamping action shake



proof. This is because the cam reaches the anchor point midway in its travel, and additional travel serves to lock the action. The nut and screw serve to position the nut for height.

Complete information on the Jig-Nut is available from the manufacturer, the Jig-Nut Corp., Dept. BB, 744 Broad St., Newark 2, N. J.

## HIGH-SPEED, LIGHT WEIGHT SANDER AND POLISHER

A new sanding and polishing machine manufactured by the Nedco Co. is designated as The Sand Brute, Model E. It is claimed to be a necessity for machine



shops, foundries, paper mills, and other industries where a rugged, light-weight unit is required daily.

The Sand Brute is available with

either 7" or 9" diameter molded disc support. The motivating power consists of a newly developed, glass insulated, 110/220 volt, 60 cycle AC or DC, Universal motor, with a no-load speed of 4500 rpm.

The body of the sander is of light weight magnesium, insuring less operator fatigue. The unit is supplied with a hand grip on the gear housing, directly over the work, providing easy work control. A removable vent plate in the housing allows easy access for cleaning the motor. The unit is also supplied with a double pole safety trigger switch.

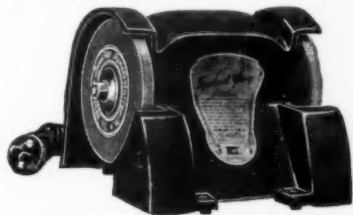
Complete specifications on the Sand Brute are available by writing to The Nedco Co., Dept. BB, 87 Rumford Ave., Waltham, Mass.

#### NEW SPEEDWAY PORTABLE BENCH GRINDER

A new addition to the SpeedWay "Blue Line" of portable electric tools has recently been introduced. The new item is the Model 117, Portable Bench Grinder, especially designed for use in factory shops. Among the unique features claimed for this new unit are included a one-piece permanent mold aluminum hous-

ing, and a newly developed 110 volt AC motor.

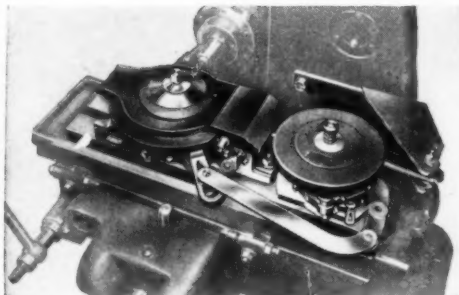
The new grinder is equipped with two 4½" grinding wheels, one coarse, and one fine; both the wheels and the motor are completely enclosed in the housing, which has a SpeedWay Blue crackle finish. The net weight of the grinder is 7½ lbs; the rating is 1/15 HP. The grinder is equipped with rubber feet which prevent marring of surfaces. According to



the manufacturers, the unit runs smoothly and silently, and is insured against creeping, since it is finely balanced.

Complete specifications on the SpeedWay 117 Grinder are available from the SpeedWay Manufacturing Co., Dept. BB, 1834 So. 52nd Ave., Cicero 50, Ill.

## Maximum Production . . . in Chucking and Indexing



With the new **Dearborn Automatic Indexer** connected to a **Dearborn Chucking Fixture**: chuck is closed **automatically**; indexed the required number of times **automatically**; chuck is opened **automatically**; piece is knocked out **automatically**.

When used with the **Dearborn Degree Indexing Fixture** it can quickly be set to index any number of degrees from 30° to 90° at one indexing and then knock out, or it can be set to index from no degrees to 90° and then not knock out.

WRITE FOR FURTHER INFORMATION

**J. W. DEARBORN**

**ANSONIA, CONN**



## A REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long sought—a more accurate and surprisingly faster way of transferring blind screw holes.



The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in  $\frac{1}{8}$ " to 1" diameters. Send for pricelist.

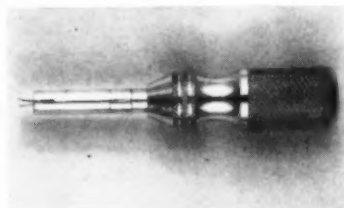
**HEIMANN MFG. CO.**

332 Lincoln Ave.

Urbana, Ohio

## TRIPLE-PURPOSE PRECISION TOOL

Here is a new product which its manufacturers claim to be a revolutionary development in the field of hand tools. It is the Slick 3-11, a recent development of Eslick Products, Inc., and is described as not merely a screw driver, but a precision instrument with an automatic holder and aligner.



As a screw holder, the Slick 3-11 is equipped with inverted and flexible bits. The holder allows screws to be started at an angle. On one-handed jobs at close quarters, the tool will hold and start the screws with ease, since the bits do not slip out of the screw slot; dropping of screws is reduced to a minimum.

As an aligner, the driver shaft acts as a chuck on round and flat screw heads, thus the screw is aligned with, and becomes almost an integral part of the driver, eliminating any wobble.

As a screwdriver, the Slick 3-11 does a thorough job, according to its designers. The driver bits remain in the screw slot, since a spring mechanism behind the bits forms a flexible connection between the screw and the hand. The smooth finish of the driver will not mar work surfaces with which it may come in contact. The narrow diameter of the shank allows it to operate in hard-to-get-at spaces.

The Slick 3-11 is at present supplied in six sizes, from  $3\frac{1}{2}$ " length to 9", with bits ranging from .032" to .040". Complete information is available by writing to Eslick Products, Inc., Dept. BB, 1312 Hawthorne Road, Grosse Pointe Woods 30, Mich.

## 3" SWIVEL VISE FOR MILLING MACHINES

A new 3" swivel base vise suitable for milling machines, shapers, grinders and drill presses is announced by the L-W Chuck Co. The vise is provided with a graduated base and can be used plain or swivel. Large Acme screws contribute sturdiness and durability.

OPEN

Plain Type

CLOSED

TRADE

MARK

CLOSED

OPEN

Offset Type

# CONTINUOUS HINGES

All hinges shown can be furnished with special holes, cutouts and bends to blue-print in metals to suit the job.

THREE-FOURTHS OFFSET

**AUTO MOULDING & MFG. CO.**

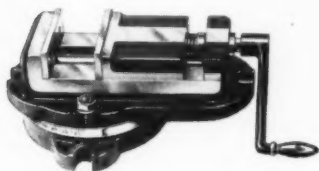
**1110 E. 87TH ST.**

**CHICAGO 19, ILL.**

SEMI-OFFSET

**SPECIFICATIONS:**  
 Open Width  $\frac{1}{8}$ " to 6"  
 Gage Material .040 to .125  
 Pin Diameter .101 to  $\frac{1}{8}$ "  
 Lengths to 120"

The width of the steel jaws is 3" and the depth 1." Four bolt and key slots are provided to attach the vise rigidly to the machine table so that work holding surfaces are at exact 90° to the table. The weight of the vise and crank is 16 lbs.



A new complete catalog of L-W Machine tool equipment will be sent to anyone addressing the manufacturer, L-W Chuck Co., Dept. KB, 23 S. St. Clair St., Toledo, Ohio.

#### CARBIDE TIPPED GROOVING TOOL

A new carbide tipped tool for production grooving has been developed by the Wendt-Sonis Co. It is designed for machining A. B. and C belt size pulleys. Nose widths and angles are held to close tolerances for accurate production of the finished pulley.

Standard tools are furnished with proper grade of carbide inserts for the material to be machined. Shanks are scientifically hardened and treated to prevent rusting. The carbide tips are covered with plastic to prevent chipping from handling.



Wendt-Sonis grooving tools are manufactured in shank sizes ranging from 5/8" x 1" to 1" square. Further details from Wendt-Sonis Co., Dept. BB, Hannibal, Missouri.

## OUR EFFICIENT TOOL DESIGNING

*means*  
**better production  
at a lower cost**

Efficient tool designing in post-war's competitive production is a "must". Our experience guarantees you tools — designed for economy of operation, resulting in your increased production at lower costs.

**COLUMBUS DIE TOOL**  
*and Machine Co.*

930 CLEVELAND AVE., COLUMBUS 1 OHIO

## MIRACLE COLLET CHUCK for FAST Production



**Operates  
without  
stopping  
Lathes**

**only \$69.50 complete**

Quick opening, quick closing, positive grip, maintains precision. Simply, easily attached to 1 1/2"-8 thread spindle nose bench lathes. Proven, dependable, 2-end split collets to 1" capacity, changed in less than 60 seconds. Available for round, hexes, squares. Complete chuck only \$69.50. Write for folder.

**\$69.50**

**MIRACLE PRODUCTS CO.**

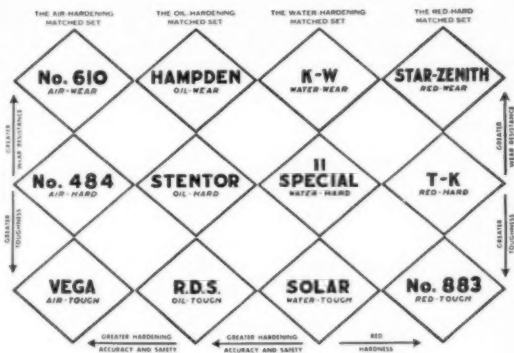
1025 Santa Fe Ave. Los Angeles 21, Calif.

## NEW MATCHED SET DEVELOPED TO SIMPLIFY TOOL STEEL SELECTION

To give tool and die makers greater simplification in the selection, heat treatment and use of tool steels, a new and improved set of Matched Tool Steels has been developed by The Carpenter Steel Co.

In recent years, air-hardening tool steels have proved themselves invaluable for jobs where minimum distortion in heat treatment and elimination of hardening hazards are essential. However, it has been found that the large variety of available grades complicates the problem of finding the one best steel for each job. Now, with the addition of 3 Air-Hardening Tool Steels to the Matched Set, tool and die makers can select, with greater assurance, the right steel for the job. Where extreme wear resistance and good toughness are needed, No. 610 (Air-

Wear) is recommended. For jobs where an ideal combination of wear resistance and toughness is essential, tool makers can use No. 484 (Air-Hard). VEGA (Air-Tough) is used for tools that require



**Micro Supreme**  
LAY-OUT AND IDENTIFICATION DYE

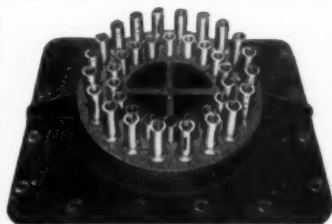
12 COLORS\*

For Tool, Die, Pattern or Template layout on metal . . . Quick identification of stock and parts . . . Shows up in sharp relief—dries instantly—easily removed . . . Write for circular.

\*Purple shipped unless otherwise specified

**MICHIGAN CHROME & CHEMICAL COMPANY**

6340 E. Jefferson Ave. • Detroit 7, Mich.



Pictured: a 38-Spindle Heavy-Duty Drill Head.

**DESIGNERS AND MANUFACTURERS OF MULTIPLE DRILLING EQUIPMENT**

*We invite your inquiry.*

**MICHIGAN DRILL HEAD CO.**

971 E. 8 MILE ROAD

HAZEL PARK, MICH.

extreme toughness with good wear resistance.

So that tool steel users can get the cost reducing advantages of the best available tool steels, two new members have been placed in the Red-Hard Matched Set. T-K (Red-Hard) combines greater hardness with improved toughness, insuring more universal application. And because No. 883 (Red-Tough) offers extreme toughness and greater red hardness, it can be applied to a wider field of uses.

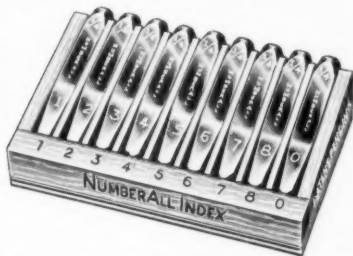
Both the Oil-Hardening and Water-Hardening Matched Sets, long familiar to tool steel users, remain unchanged.

The 12 steels that make up the complete Carpenter Matched Set are so inter-related that each takes up the work where the other leaves off. As a result, tool makers can actually know in advance what results to expect as they move from one steel to another. Because it is easier to select the right steel for each job, production can be increased and unit costs lowered through longer tool life and fewer tool failures. And the fact that the tool steel user can now choose from far fewer steels to do over 90% of his tool making jobs, means less complicated heat treating procedures, lower inventories and fewer chances of tool steel mix-ups.

More information on the selection, heat treatment and uses of the steels in the new Carpenter Matched Set can be obtained from The Carpenter Steel Co., 314 West Bern St., Reading, Pa.

#### STEEL TAPER STAMPS AND INDEX STAND

A new design and manufacture of Long Taper Stamps and a new Stamp Index Stand, designated as the Pik Quik, has recently been developed by the Number-All Stamp & Tool Co. An outstanding



feature of the long taper stamp is the new chamfered corners for the convenient locating of the base of letters.

## SPRING-AIR PRESS

A compressed air operated press to replace the Kick press featuring

- Adjustable Blow 0 to 5,000 lbs.
- Controllable Speed Push Stroke 500 lbs.
- Two Handed Safety Release
- Speed 100 Strokes /Min.
- Adjustable Throat Height
- Adjustable Stroke With Positive Stop



Write for bulletin

Exclusive Territories open

Prompt deliveries

## WINTER PRODUCTS INC.

189 State St.

Bridgeport 3, Conn.

## MERCOID CONTROLS

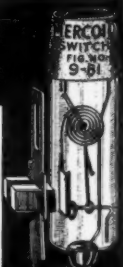
Designed to automatically regulate electrically operated equipment in accordance with changes in temperature, pressure, vacuum, fluid level or mechanical movement

CATALOG SENT UPON REQUEST

## MERCURY SWITCHES by MERCOID

THE MOST IMPROVED TYPE IN MERCURY CONTACT SWITCH CONSTRUCTION. \* MERCOID SWITCHES ARE NOT SUBJECT TO OPEN ARCING, NOR CAN CONTACTS PIT OR STICK. THEY ARE NOT AFFECTED BY DUST, DIRT OR CORROSION.

Write for Bulletin No. 500



## THE MERCOID CORPORATION

4201 BELMONT AVE., CHICAGO, ILL. • U. S. A.

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

## UTILITY AIR PRESS

A Lightweight Air Operated press for General Use where a squeeze action is desired.



- Force 12 Times Air Line Pressure
- Hand or Foot Operated
- Shut Height 9"
- Stroke 1", 10" between Tie Rods
- Portable weighs 30 lbs.
- Economical

## Winter Products Inc.

189 State St., Bridgeport 3, Conn.



## SAVE Labor and Time

Eliminate heavy lifting. Cut handling costs. Table

swivels and locks in any position. Can be varied 15½° by slight foot pressure, leaving operator's hands free. Engineered and built by tool engineers, experienced in production of special machines, dies, jigs and fixtures for exacting requirements.

Send TODAY for illustrated catalog No. 2.

**MIDWEST TOOL & ENG. CO.**  
112 Webster St., Dayton, Ohio

This facilitates correct spacing and aligning of letters and figures when stamping. The stamps are made of tough tool steel, of heavy stock and bevel, with steel letters and figures, each deeply engraved. The top of the shank is tempered for safety. Each character and size is indicated on the thumb side of the stamp for rapid identification of the character, and to determine the correct side of the stamp to use.

The new Numberall Pik Quik Stamp Index Stand, illustrated, is designed to save time and to expedite stamping work. Any character of long taper stamp can be picked up and replaced in the Index Stand, thereby keeping the stamps in perfect order.

For information, send for Bulletin LP8, to the Numberall Stamp and Tool Co., Dept. BB, Huguenot Park, Staten Island, N. Y.

## NEW PACKAGING PLASTIC

Thermo-Dip N. S., the new hot melt compound for protecting machine tools and cutting gears from corrosion, abrasion, and shipping hazards, is announced by Eronel Industries, 5714 W. Pico Blvd., Los Angeles, Calif. The new member of the Thermo-Dip series has a higher tensile strength, greater elongation, and lower melting point.

Thermo-Dip N. S. is pale amber in color, and identifying marks can easily be read because the product is transparent. It is easily removed by stripping;



can be used again repeatedly, and maintains its flexibility and properties over extended periods.

The plastic has great resistance to salt water, high humidity, low temperature, etc., and is resistant to shock and abrasion. It is well suited for all types of metal products, such as bearings, cutting tools, motors, etc., and is also applicable for masking prior to plating, etching, or sand-blasting.

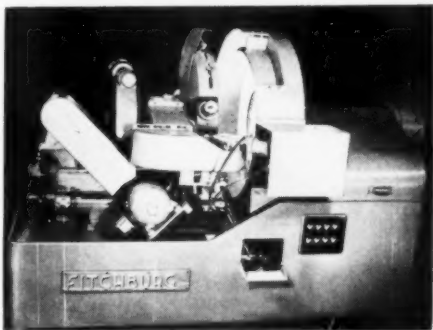
## FITCHBURG VALVE SEAT GRINDER USES NEW PRINCIPLE FOR CYLINDRICAL GRINDING

A basically new method of cylindrical grinding, called "Consta-Contac Grinding"—by which three or more parts are in constant contact with a **single** grinding wheel—is used in an Automatic Valve Seat Grinder developed by Fitchburg Grinding Machine Corp. This particular machine, the first of two to be delivered to an American automobile manufacturer, will grind engine valve seats at the rate of 2,160 per hour, a vastly increased rate over that possible by any other present methods, according to the manufacturer. This high production rate is possible because three valves are in contact with the wheel, "sparking" at all times. Thus, although the actual sparking time for any part is the same as in ordinary cylindrical grinding, the new Fitchburg method grinds three parts during the sparking time of a single part. Both loading and unloading are automatic.

The unique feature claimed for this grinder is in the way the valves are fed to grind to size while they pass through a 90-degree sector of the wheel face. The arrangement of the machine comprises a vertical grinding wheel, belt-driven; and a vertical turret having 12 driving spindles to receive the valve stems. The spindles are quill type, self-contained, and are powered by a 1 hp motor working through a friction drive. The turret is belt-driven by another 1 hp motor. The wheel rotates at 5,000 surface ft. per min. and the valves at 80 to 110 surface ft. per min.

A special design feature is the relationship between the wheel and the turret. The turret axis and the wheel axis are in the same horizontal plane, but the vertical plane of the turret axis is set at a slight angle to the wheel axis. This angle is selected so that at top center the grinding wheel edge is separated from the valve face path by a distance equal to the average amount of stock to be removed. The angle is altered by pivoting the table that carries the turret, and the turret drive and spindle motors. For the job illustrated, the angle is 0 deg. 46 min. between the axes; this is therefore the angle between the planes of the wheel and the turret.

The table is adjusted longitudinally so that the rough valve seat will contact the grinding wheel at top center. The



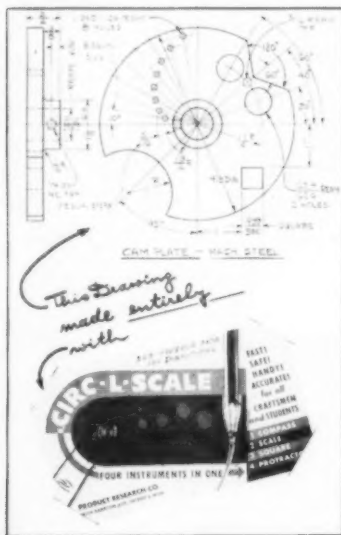
wheel surface is beveled at the angle that complements the valve bearings face angle. As the spindle turret rotates to carry the valve downward, the valve feeds across the beveled face of the wheel. The feeding action occurs because this quadrant of the circle described by that valve face will angle across the beveled face of the wheel. By the time the valve reaches the horizontal it is ground to size. A cam releases the workholder to drop the valve on the downward arc onto a belt conveyor, which carries it out of the machine.

If a particular valve has more or less than the average amount of stock to be removed, no adjustments are necessary. In addition to the simultaneous grinding of three valves and the automatic size control, this method has the advantage of distributing wheel wear, because the valve is ground over a wide portion of the grinding wheel face. This wiping action removes burr and prevents grooving of the wheel. Complete information on the "Consta-Contac" method is available upon request to the Fitchburg Grinding Machine Corp., Dept. BB, Fitchburg, Mass.

### POCKET-SIZED DRAFTING INSTRUMENT

The Circ-L-Scale is a pocket size drafting instrument which combines Compass Scale, Square and Protractor all into one handy unit. Mechanics, Toolmakers, Die-makers, Draftsmen, Students, in fact anyone, having to make drawings frequently, will soon find the Circ-L-Scale indispensable in their daily work. Using colored pencils, parts can be shown in

tool-drawings and various operations or treatments, may be so indicated. Most Ball-point pens, when used with the Circ-L-Scale, and tracing paper, permit the making of tracings, without making previous pencil drawings.



The Circ-L-Scale is made of Vinelite and is mounted on a attractive Card, the reverse side of which gives full directions for the use of the Scale. Write: Product Research Co., 16179 Hamilton Ave., Detroit 2, Mich.

#### PNEUMATIC GUN ELIMINATES CHIP HAZARDS

The Buffalo Machinery Co., Inc. announces the Buffalo Pneumatic Chip Gun, a new method for removing cuttings from blind drilled and tapped holes. This unit is claimed to eliminate the hazard of flying chips always present when cuttings are blown out of blind holes, by removing cuttings thoroughly and safely and depositing them in the body of the gun to be emptied later.

The gun is operated by placing its nozzle over the hole and releasing the air by thumb pressure. The air stream, striking the bottom of the hole, rebounds,

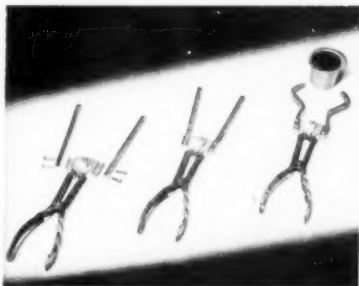
carrying the cuttings upward into the body of the gun. In the body, the air expands, loses its velocity and strikes the baffles, dropping the particles of metal to the bottom of the body while the air itself continues upward and escapes at the exhaust at low pressure. The chips can be cleaned from the body of the gun at very slight pressure.



These guns are manufactured in two sizes—Model A for holes  $\frac{1}{4}$ " to  $\frac{3}{8}$ " diameter and Model B for holes  $\frac{1}{2}$ " to  $1\frac{1}{2}$ " diameter. Further information and Bulletin No. 1011 can be secured from Buffalo Machinery Co., Inc., Dept. BB, 838 Grant St., Buffalo, 13, N. Y.

#### ADJUSTABLE ALUMINUM JAW PLIERS

A light-weight, hand-fitting plier which provides protection for punch and die press operators has been recently developed by the Universal Safety Equip-



ment Co. Toggle action manipulation increases the leverage of this accessory, thus providing a firm grip while mini-

mizing fatigue. The jaws are soft aluminum straight bars, and can be quickly shaped cold in the plant to accommodate the part to be handled. Because of their nature, the jaws cannot damage dies, and are replaceable if damaged, or if a different shape is required.

The pliers are available in two styles: "A", with toggle action, which holds the work piece securely, with slight hand pressure; "B" opens when pressure is applied to the handles, and closes and grips the work piece by spring action, when pressure is released. Complete information on this new accessory is available from the manufacturer; address the Universal Safety Equipment Co., Dept. BB, 2921 No. Cicero Ave., Chicago 41, Ill.

#### SEALTIGHT WELDING TIPS OFFER HIGH CONDUCTIVITY

A new line of resistance welding tips claimed to permit speedier welding, faster cooling, and longer life has been announced by the Keaton Mfg. Co. Known as K-B Sealtight Welding Tips, the line has a range of sizes and styles including seam welding wheels and standard replaceable pointed, flat, dome, and offset tips.



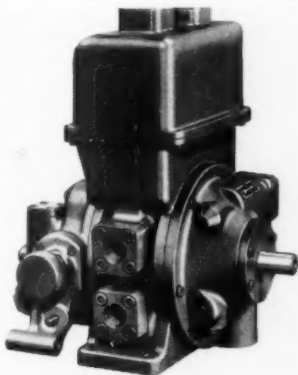
Specially compounded copper-base alloys—K-B Alloy No. 10 and No. 12—have been developed to offer high electrical

conductivity for speedier, sharper welds and high Rockwell hardness for longer tip life. Quick cooling of the tips is effected by scientifically correct water holes and the naturally faster heat dissipation of the specially-developed alloys. Continual laboratory checking assures constant high quality and uniformity of material. A highly important feature of K-B Sealtight Tips is claimed to be the precision-made Morse Tapers guaranteed to prevent water leakage and possible fouling.

Complete information, with specification tables and drawings, are available in a new folder. Write to Keaton Mfg. Co., Dept. BB, Box 219, Butler Wis.

#### OILGEAR ANNOUNCES NEW FEED PUMP

A new fluid power, variable delivery Feed Pump has recently been perfected by the Oilgear Company. The unit is



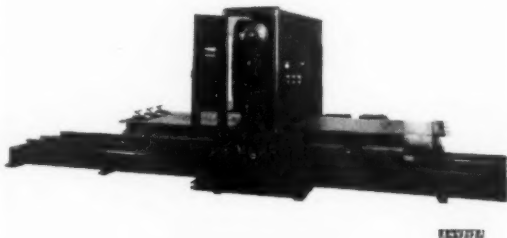
described as simple and compact, easy to apply either close by or at a distance, and is claimed to be quick and positive in action. The Feed Pump is 100% electrohydraulically controlled, and is automatic pressure compensated. Either fine or coarse feeds can be pre-set over a 20:1 range. The mechanism provides from 13:1 to 265:1 variable ratios between the feeding and rapid traverse speeds. Only two pipe lines are required to complete the fluid power system.

An eight-page bulletin 44200, illustrating and describing the new Feed Pump in detail is available upon writing to the Oilgear Co., Dept. BB, 1344 W. Bruce St., Milwaukee 4, Wis.

## HILL-ACME DUAL ROLL ABRASIVE BELT GRINDING AND POLISHING MACHINE

The Hill-Acme Co. has introduced a line of 2-roll Vertical Abrasive Belt Grinding and Polishing Machines for the flat polishing of ferrous and non-ferrous metals and other materials. The machines are built in a progression of widths up to a maximum of 60". They are available in three general types: Strip Type, for processing strip material in coiled form; Plate or Bar Type, which incorporates the use of feed or pinch rolls for conveying the material under the polishing head; Sheet Type, with reciprocating Hydraulic Table Drive.

Endless coated abrasive belts 10'6" long are utilized on these units; this short belt is more economical than the 20'3" belts used on previous models, according to the manufacturers.



The polishing head is the same for all three types of machines; basically, it incorporates a dynamically balanced upper steel idler roll, and a lower rubber covered contact roll, over which the belt travels. The rubber covered contact roll is the driving roll, thus eliminating slip-

## New STEEL INSPECTOR'S STAMPS



**Faster Identification of Inspectors or Operators.** Different borders may be used for different shifts. Available in 4 sizes. Write for prices today.

**NEW METHOD STEEL STAMPS, Inc.**  
147 JOE CAMPBELL DETROIT 7, U. S. A.

## HAND TAPPING with MACHINE PRECISION

**\$52.50 F.O.B. MINNEAPOLIS**



Anyone can operate a Dahlstrom Tap Guide. Just fasten it to a post, slip a Tap Adaptor into the spindle and turn the handle. Cuts tap breakage down to zero. \$52.50 F.O.B. Minneapolis, including 7 Adapters. At mill supply houses, or Dahlstrom Mfg. Co., 416 South 6th St., Minneapolis 15, Minn. ASK FOR CIRCULAR.

**Dahlstrom TAP GUIDE**

page of the abrasive belt, and increasing belt life. A pneumatic belt centering device assures positive tracking of the belt, despite dust, moisture, or other potential hazards.

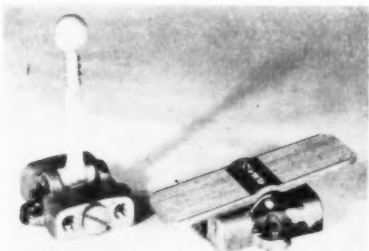
Outstanding features claimed for the "Hill" 2-Roll unit include the centralization and accessibility of all controls; no separate grinding machine is required to redress the work roll, since it can be redressed in place at running speed simply by using a steel redressing plate which is standard equipment. Time required in changing long abrasive belts is reduced to a minimum through the employment of the shorter, 10'6" belts.

For complete information or recommendations, write The Hill-Acme Co., Dept. BB, 6421 Breakwater Ave., N.W., Cleveland 2, Ohio.

#### POPPET VALVE HAS MANUAL OR PEDAL ACTION

Ross Operating Valve Co., manufacturers of air control valves, have introduced a new small poppet type valve designed expressly for operation of light machine tools, vises, and other machinery adaptable to air control.

Quality of materials and workmanship are emphasized, construction being of brass and stainless steel, with a hi-carb



neoprene valve seat. A feature is the optional hand lever or foot treadle, the vertical lever action being particularly suitable for small machine tool installations. In the foot treadle style, No. 600 is 3-way, No. 601 4-way. The hand lever type, No. 602 is 3-way, No. 603 4-way. All are available in locking, non-locking or neutral-position types. For details write Ross Operating Valve Co., Dept. K, 6480 Epworth Blvd., Detroit 10, Mich.

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

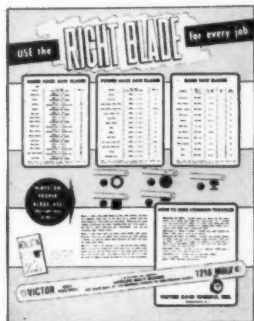
## make blade selection



## a cinch

## not a search

use  
the  
new



## VICTOR WALL CHART

You'll see the name of the blade you want to use — hand, power or band saw — opposite the type of material you want to cut. You'll see this valuable information quickly, easily, when you tack the new Victor wall chart over your tool crib or in your machine shop.

What's more you'll get a lot of inside tips on how to get longer life, the best use, from every blade... There are plenty of ways to cut costs, make money, on this new Victor Wall Chart... It's printed clearly, attractively, and it's yours absolutely FREE.

Drop in on your Victor supplier — or send him a card today. The supply is limited. Also see him the next time you want the finest in cutting performance. He carries a full line of Victor blades — one for every job a hack saw or a band saw can do. Victor blades cut better, too, on metals, plastics, and other non-metals... cut faster, cleaner, last longer.

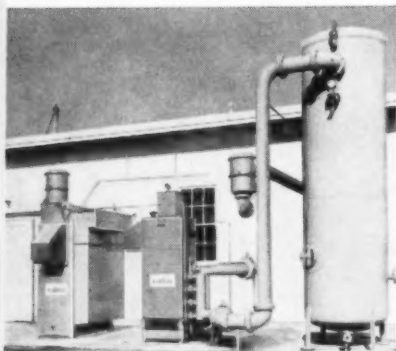


**SAW WORKS, INC.**  
MIDDLETOWN, N. Y., U. S. A.

Makers of Hand and Power Hand Saw Blades, Frames and Band Saw Blades

3708

## STOP MOISTURE DAMAGE TO COMPRESSED AIR TOOLS AND PROCESSES



• For the driest possible compressed air or gas, use the Niagara Aero After Cooler. Reducing the temperature of the compressed air below that of the air surrounding your lines and tools, it prevents condensation in them and saves trouble and expensive repairs and frequent replacement of air tools. It produces compressed air with 30% to 50% less moisture than by ordinary cooling methods. In addition, it saves the cost of cooling water, paying for itself in a short time.

If you use compressed air for operating tools or for any process that brings it in contact with your product, the Niagara Aero After Cooler will decrease your costs and prevent damage.

Write for Bulletins 96-MT and 98-MT

### NIAGARA BLOWER COMPANY

Over 30 Years of Service in Industrial  
Air Engineering

405 Lexington Ave. New York 17, N. Y.

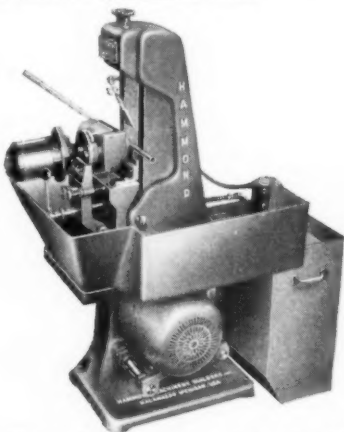
District Engineers in Principal Cities



**AIR ENGINEERING EQUIPMENT**

### HAMMOND CENTERLESS WET-OR-DRY GRINDER-POLISHER

A new addition to the Hammond line, known as the OD-1 Cylindrical Grinder-Polisher for rods, bars and tubes from  $\frac{1}{8}$ " to  $1\frac{1}{4}$ " diameter, is announced. The OD-1 is a centerless machine using coated abrasive belts for grinding and polishing. For stock removal, it will remove up to .005" per pass on ferrous metals, and up to .010" on non-ferrous. The work supports will handle  $\frac{1}{2}$ " bars up to 18' long, and 1" bars up to 8' long. Accuracy is .001" on production time.



The endless abrasive belt is 4" wide, 60" long, and may be operated wet or dry with coolant. Wet operation is recommended, since it gives better finish, does not discolor the work from heat, and gives higher production and longer belt life. Two methods of feeding are employed—through-feed and in-feed. The first method is generally used, and is accomplished by swinging the regulating wheel on its horizontal axis from 0 to 12°. The rate of feed can be varied from 0 to 18' per minute.

For further information, write to Hammond Machinery Builders, Inc., Dept. BB, Douglas Ave., Kalamazoo 54, Mich.

### CUTTING OILS OF HIGH SULPHUR CONTENT

A major improvement in cutting oils, combining extremely active sulphur content with absence of disagreeable odor, has been achieved by the Gulf Oil Corp., according to a recent announcement. The

new development has been incorporated in improved grades of Gulf's Lasupar Cutting Oil, Electro Cutting Oil, and L.S. Cutting Base.

The sulphur in these oils is chemically combined by an exclusive process so that it is active over the entire range of a cutting operation. The efficiency is ascribed to the fact that the amount of chemically active sulphur (rather than the total percentage of sulphur contained) governs cutting oil performance.

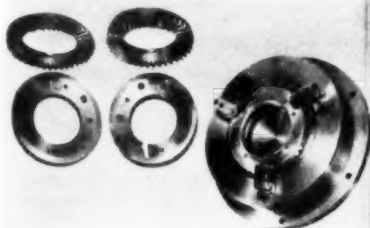
The overcoming of disagreeable odor makes available the advantages of these highly chemically-active sulphur oils to all types of operations with assurance of agreeable operating conditions.

#### DRAW-BAR TYPE GEAR CHUCK

Announcement is made of an improved Garrison Gear Chuck for locating bevel gears by the pitch line of the teeth while grinding the bore and a portion of the back face at one chucking. The chuck is draw-bar operated, yet adaptable to different machines, without the necessity of providing the proper threaded connector, since the operating mechanism is not attached or connected direct to

the draw bar. The unit can be operated by the machine hand lever air cylinder, or by other means.

Different gears can be handled in the same chuck through the use of the extra Garrison Bevel Interchangeable Locating Rings also indicated in the cut. Set-ups or change-overs can be made in ten minutes, according to the manufacturers.



Various sizes are available, each accommodating different gears within its range. Details can be obtained by forwarding gear prints to the Garrison Machine Works, Inc., Dept. BB, 515-525 Banknock St., Dayton 4, Ohio.

#### YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

Vise No.	Width of Jaw, Inches	Open, Inches	Weight Pounds
1D	3 1/2	3 1/2	12 1/2
2D	5	5 1/2	23

Do you need a vise of ANY type?

Write today for bulletins on the extensive Yost line

**YOST MFG. COMPANY**  
1335 SO. MAIN ST.  
MEADVILLE, PENNSYLVANIA

**DIAMONDS**  
FOR WHEEL DRESSING TOOLS

**DIAMONDS**  
FOR THREAD GRINDING TOOLS

**DIAMONDS**  
FOR ALL INDUSTRIAL PURPOSES

**KOEBEL**  
KOEBEL DIAMOND TOOL CO.  
9436 Grinnell Avenue, Detroit 13

**NOW CALIFORNIA PREFERS**



**Thanks to this Faster Cutting  
Blade West Coast Firm Lands  
the Big Cutting Jobs and  
Makes Deliveries on Time.**

According to one well-known California steel company, they get faster cutting and longer wear from *Technite* blades. For example, one recent order called for some pieces of 6" square type Stainless Steel to be delivered the next morning. *Their cutting time was five hours.* Furthermore, even though the blade had been in use for a day and a half before the Stainless job, it was still used for another day and a half after the Stainless job was completed.

Such outstanding performances of faster cutting are winning many lucrative new jobs for this progressive company. At the same time, the longer lasting feature enables them to keep their own costs down. You, too, can step up production, yet cut costs with *Technite* blades. Try them in your own shop. Call your distributor today.

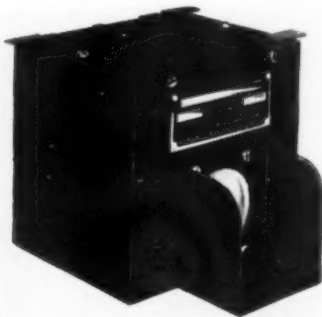
**THE CAPEWELL MFG. CO.**  
HARTFORD 2, CONN.

METAL WORKING CRAFTSMEN FOR OVER 65 YEARS

#### **NEW ELECTRONIC UNIT HAS WIDE APPLICATION**

A new photo-electric device, the Electronic Handyman, has been developed by John T. O'Connor & Co. The unit is easy to install, is compact and self-contained, and plugs into any convenient outlet, according to its designers. It receives the plug for any item to be controlled at either of its normally on or normally off receptacles.

In addition to performing operations of ordinary photo-electric switches, the Electronic Handyman claims certain exclusive features. A combination layout and special circuit working on internally converted direct current provides rapid switching operations for high-speed counting, limiting travel, etc. The device will measure light intensity as well as acting as a switch. There is provision



in the housing for converting the unit into a combination counter or meter.

The internal arrangement of the Handyman provides for filters for color or infra-red (invisible) operation. A 2" light gathering lens, together with a directional internal optical arrangement (selective only to light received from a 5° arc) makes possible various gaging, measuring, and controlling operations all in one unit, and without the use of a sensitivity adjustment, according to O'Connor engineers. As an example of the unusual basic sensitivity, it is claimed that the Electronic Handyman will operate in broad daylight on the light received from a small hand flashlight even though the Handyman is within 10° of facing directly into the sun.

With suitable additive mechanisms, the Handyman will perform a wide variety of useful and protective operations of detection and inspection in factory or

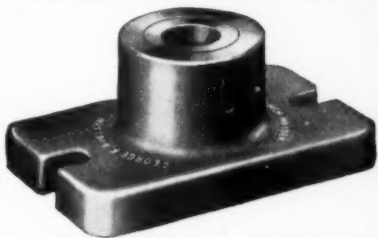
office. O'Connor engineers offer free counsel regarding the application of this instrument to any specific problem outlined to them. Write to John T. O'Connor & Co., Dept. BB, 222 South Valley Road, West Orange, N.J.

#### BUB MASTER SHANK HOLDER

The Master Shank Holder is a development of George F. Bub and Son, designers and producers of tools and machinery parts. This new accessory serves as a holding device for punch, die, and tool holders, shanks, adapters, and shanked tools of all kinds. Its use is claimed to eliminate makeshift methods for holding these tools while performing virtually every operation required in ordinary bench or layout work common to the average tool, die, or machine shop.

The Master Shank Holder is of rugged construction, designed to withstand long and hard wear. The body is a close grained, grey iron casting, 1" thick, 5" wide, and 8" long. Clamping slots at each end enable the Holder to be fastened to machine tables, face plates, or to a larger plate so that punch holders larger than the base may be held for drilling without tipping over.

The top of the boss of the Shank Holder, the hole, and the bottom of the base are precision machined square and parallel. A set screw in the side of the boss holds the work in place, with clearance provided in the standard hardened and ground bushing, furnished with the



Holder. The Standard bushing is available in either 1/4", 1 1/2", or 1-9/16" diameters; special bushings or adapters can be furnished for individual requirements. The boss is 3 1/2" in diameter; overall height of the accessory is also 3 1/2".

Complete information on the Master Shank Holder is available from George F. Bub and Son, Dept. BB, 11413 Madison Ave., Cleveland 2, Ohio.

#### SEE BETTER with a MAGNI-FOCUSER

Here's an  
aid to  
GREATER  
PRODUCTIVITY



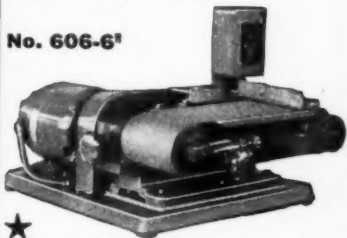
Pat. U.S.A.

EVERYONE in your plant who does precision work can do it easier, faster, safer, better by wearing a Magni-Focuser. This binocular eye-loop enables you to see an object sharply magnified with the comfort and clarity of normal vision. Relieves eyestrain—lessens fatigue—reduces accidents. Allows free use of both hands. Available in different magnifications, from 2 1/2" at \$8.50 to 3 1/2" at \$10.50. If your distributor cannot supply you, order direct. Money refunded if Magni-Focuser does not help you see better.

**EDROY PRODUCTS CO.**  
478 Lexington Ave., New York 17, N. Y.

#### PEERLESS BELT SURFACER ★

No. 606-6\*



This BELT SURFACER is accurately balanced and sturdily built for hard constant use. It is smooth running and adjustments are quick and convenient. Abrasive belt is 6x42" handling a wide range of work speedily and accurately. Let us send bulletin giving full details, covering our complete line of bench and floor type surfacers, 6" to 20" sizes.

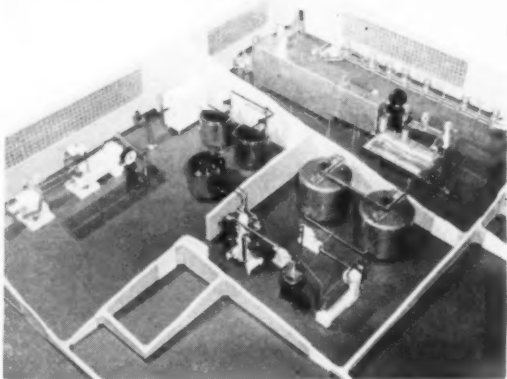
Let us send bulletin giving full details.

**PRODUCTION MACHINE CO.**  
GREENFIELD, MASS.

## MINIATURE MODEL MAKER STREAMLINES PRODUCTION OF VISUAL PLANNING EQUIPMENT

The Dennis C. Locke Co., manufacturers of custom-built scale models and visual planning equipment, has devised a new production program where in miniature true-to-scale models are built speedily to order so that companies may better streamline their selling techniques. With the aid of these models companies can now introduce well-established and new products in model form right on the customers' desks and thus show the most efficient use of valuable floor space.

The use of such miniature model material, designed to simplify the graphic presentation of equipment for anything from giant engineering projects to small store or shop layouts is said by sales managers to be of great assistance in



bringing special features or plant equipment of the layout of a plant into graphic focus for prospects. Long technical dis-

## HARTFORD SUPER-SPACER



## for QUICK INDEXING

Milling • Drilling • Grinding •  
Jig Boring • Planing • Slotting  
• Boring and other Operations

Illustrated in the Super-Spacer set up with drilling attachment. Flexibility of design allows for adjustment to various jobs within the range of the attachment. In this case the Super-Spacer permits quick-as-a-flash indexing on a job that calls for drilling spaced holes in a circular path. This is but one of the many time saving applications of the Super-Spacer. If your shop can use quick but accurate indexing, write our Dept. S.

Hartford Special also makes the "Four-point" Milling Vise and the "V-Block" Fixture proven time and money savers on Milling, Boring, and Inspection Set-ups.

## HARTFORD

*Special*

The Hartford Special Machinery Co.  
HARTFORD 5, CONN.

cussions are thus reduced to a minimum and complicated and expensive sketching becomes unnecessary.

In the photograph the complete layout of a modern dairy plant is carried out through the use of Dennis Locke scale model equipment. Similar models can, of course, be made of any other type of equipment for plant, shop or store layouts; information and samples can be obtained from the Dennis C. Locke Co., Dept. BB, 5657 West Ohio St., Chicago 44, Ill.

### 8-TON CAPACITY HEAVY DUTY FOUNDRY BOX

A new, heavy duty, all-steel ventilated box is announced by the Palmer-Shile Co. It is designed especially for foundry installations where uniform cooling is a requirement; it also prevents loss of sand due to dumping, since the sand drains through the sides of the box and can be used again. It is adapted for use in forge casting or heat treating departments, and can be used wherever there is a need for rapid, uniform cooling of hot metals.

The box is constructed of a heavy gauge steel mesh on four sides and bottom, with a rugged all-welded angle



iron framework. Steel mesh affords complete visibility of contents at all times and assures rapid identification of parts without unstacking or moving boxes. Built with legs for use with fork lift trucks or cranes, or can be built with casters, rubber or metal wheels. Stacking guides are welded on the corners to permit uniform stacking. The model used in illustration has a rated load capacity of eight tons. Complete information is available from the Palmer-Shile Co., Dept. BB, 12648 Mansfield Ave., Detroit 27, Mich.



In manufacture of special tools for maximum production the skill of the tool craftsman is the most essential element.

Andersons, Inc., specializing in precision tools and fixtures are so manned and equipped as to assure the best in tool design and craftsmanship.

Your inquiries for special tooling are solicited and will receive prompt efficient service. Let us help you solve your tooling problems.

### GAGES, FIXTURES, SPECIAL TOOLS

FORM TOOLS—DOVETAIL AND CIRCULAR  
MILLING CUTTERS—END MILLS—REAMERS

Write Us or Phone Buckingham 3417

## Andersons, Inc.



2333 NELSON ST., CHICAGO 18, ILL.

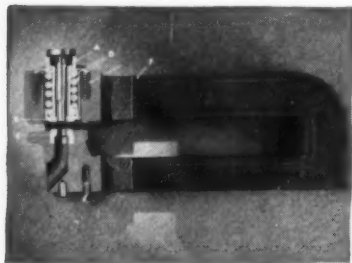
When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

### NEW HOLE PUNCHING FIXTURE FOR PRESS BRAKES

A new method of mounting hole punching and notching units in press brakes by the use of "Strip" Templates is announced by the Wales-Strippit Corp., specialists in punching and notching equipment. This process provides faster setups, reduced press down time, and simplifies pattern storage, according to the manufacturer.

The "Strip" Template fits into a Wales Press Brake Rail equipped with a T-slot. The rail remains in the press brake when setups are changed. The templates are simply lifted out of the rail. Dowel or pilot holes are drilled and reamed in the templates at the center of the locations of holes to be punched. These holes in the template are for the pilot pins in Wales units. Pilot pins are located in the bottom of units on the center line of punches and dies incorporated in the units.

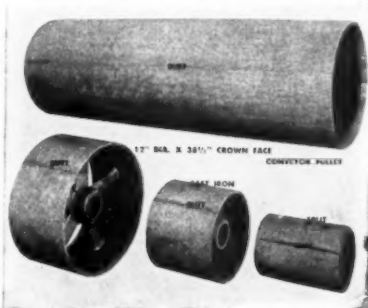
Setups of Wales units on "Strip" Templates are made outside the press, and are placed in the press brake rail, then bolted to the T-slot. After a pattern has been run, the same group of Wales Hole Punching and Notching Units may be used in other combination hole punching and notching setups, thereby eliminating dead storage of setups by keeping them in almost continuous operation. In many cases, dowel or pilot holes for several setups may be drilled in one "Strip" Template.



The picture shows a cutaway view of a Wales Type BL Hole Punching Unit indicating the relationship of all component parts. For complete information on the Wales Units with "Strip" Template setup in press brakes and mounting plates in stamping presses, write for Catalog BL to the Wales-Strippit Corp., Dept. BB, 345 Payne Ave., North Tonawanda, N. Y.

### CONDERSITE LAGGING ELIMINATES BELT SLIPPING

A new development to cope with the problem of machine belt slippage has been announced by the Condersite Engineering Corp. It is a special fabric designated as Condersite. The material is applied direct to pulley surfaces, with no riveting or bolting required. It is available in all belt sizes. According to



the manufacturers, Condersite sustains temperatures up to 325 F, and is impervious to cold, moisture, and steam; it adheres firmly to steel, cast iron, wood, or fibre pulleys.

The manufacturers claim that pulleys covered with this new composition increase transmission efficiency up to 30%, since its use eliminates belt slipping and overheating, at the same time prolonging belt life, due to improved traction, which obviates friction. The added gripping power of Condersite permits looser running of belts, effecting a reduction in electric power and bearing wear. Pulleys are claimed not to require additional use of belt dressing.

Complete information regarding this product is available from the Condersite Engineering Corp. Dept. BB, 2015 Chancellor St., Philadelphia 3, Pa.

### DURO HEAVY-DUTY GRINDER

High speed, smooth, vibrationless operation and ample power for every job are some of the advantages claimed by Duro Metal Products Co., for their new, improved model Heavy-Duty Grinder. Streamlined to fit the operator's hand, this new grinder is said to be one of the most powerful and rugged grinders available for its size. Driven by a Duro Universal Motor that develops 42 watts output at approximately 20,000 RPM, this

grinder operates on 60 cycles or less at 110 volts AC or DC current. The spindle revolves on sealed precision ball bearings that take up all thrust and radial loads. A propellor-type fan pulls a large volume of air over the motor, keeping vital working parts cool at top speeds.



The threaded type collet chuck overhangs the housing only 5/16", making it easier to do delicate, precision work. Two collets, one for 3/32" shanks and one for 1/8" shanks are included.

For further information, write to Duro Metal Products Co., Dept. BB, 2651 N. Kildare Ave., Chicago 39, Ill.

#### HYDRAULIC POWER FEED FOR CANEDY-OTTO PRESSES

The Canedy-Otto Mfg. Company, Chicago Heights, Ill., announces the new development of a hydraulic power feed for their sliding head model drill presses. The new accessory combines efficiency with simplicity of design. It is not only incorporated into new Canedy-Otto drill presses, but will be available for attachment to existing models.

The new attachment makes the Canedy-Otto machine fully automatic. It is a convenience but far more important is the accurate control that it offers in operating under various conditions.

The hydraulic power feed can be operated automatically, semi-automatically, or manually. It is provided with convenient adjustment for obtaining various rates of feed. Units equipped with this feed may be used for honing, lapping, tapping and drilling operations. In the automatic position, the unit provides reciprocating action to the spindle.

## ARGUTO OILLESS BEARINGS

USED

ALL OVER THE WORLD

... IN MANY DIFFERENT  
APPLICATIONS

"OUTWEARS THE BEST  
BRONZE METAL"

20 years



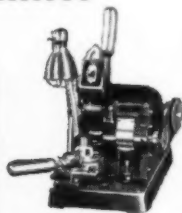
ARGUTO OILLESS BEARING CO.

WAYNE JUNCTION

PHILADELPHIA

If it's a  
**SMALL PART..**  
Mill it with a  
**New Rouse Hand  
Miller**

**NEW**  
*Rouse*  
**HAND  
MILLER**



**\$98 (Without Fixtures)**  
F.O.B. Chicago, Motor Extra

*Rouse*  
**Fixture Set-Ups  
that Speed Pro-  
duction.**



parts for instruments, electrical work,  
aviation components, etc.

Available for immediate shipment.  
Write for illustrated circular and  
full details.

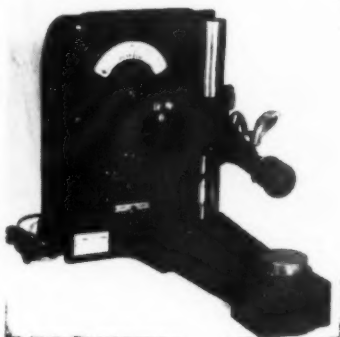
**H. B. ROUSE  
AND COMPANY**

2216 N. Wayne Ave. Chicago 14, Ill.

**THE PENETOR FOR MEASURING  
SURFACE HARDNESS**

The property of hardness is usually defined in relation to some known factor. Formerly, hardness was approximately measured by filing the material; this is still done, but the results are too uncertain to have any value in precision measurement. A new, rapid, and accurate instrument for the measuring of both surface hardness and case depth has been developed by the Precise Instrument Co. This device, the Penetor, makes accurate readings of surface hardness and case depth with no special preparation of the specimen and with no marring of the surface, since no pressure is applied.

The Penetor is also able to accomplish internal measurements, such as the inside of a cylinder, or the bore of a gun barrel; such tests are claimed by the manufacturer to be exclusive with the Penetor. For checking and controlling the hardness of gage blocks, for example, the Penetor is claimed to be the only instrument that can make these tests and still permit the piece to be used with no surface damage.



Like other hardness testers, the Penetor will measure a single specimen. Its particular value, according to the Precise Instrument Co. lies in its use in production and inspection work. Due to its speed of operation, virtually every piece can be examined. Since there is only one moving part, there is no lag, and the Penetor will measure surface hardness and case depth as easily and rapidly as the specimens are placed on the anvil.

Complete technical data is available

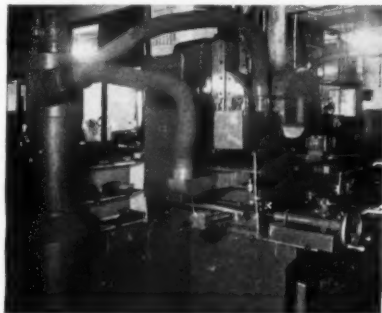
by writing the manufacturer and distributor, the Precise Instrument Co., Dept. BB, 5034 Allendale Ave., Detroit 4, Mich.

#### OVER-UNDER SUCTION HOOD FOR SURFACE GRINDERS

The photograph shows a Torit No. 19-FM Dust Separator connected to a Gallmeyer and Livingston No. 45 Surface Grinder, with a specially designed hood which results in virtually 100% dust removal, according to the Torit Manufacturing Co. The upper section of the over-under suction hood is attached to the grinder head, and the lower section mounted on the bed of the grinder. The entire hood assembly is adjustable according to the requirements of various surface grinding operations.

Such elaborate hooding necessitates the installation of larger dust collectors than customarily installed heretofore on surface grinders. However, the over-under suction hood will trap dust with positive efficiency, the Torit Manufacturing Co. claims. This factor is an important consideration, especially in the numerous states where local codes governing dust control are becoming increasingly stringent.

This new unit is in line with the company policy of providing ultra-efficient dust control equipment for varying state code requirements, individual plant maintenance standards, and differing job

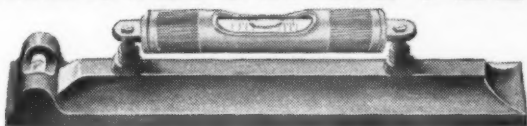


requirements. Complete information on the above unit and similar equipment is available from the Torit Manufacturing Co., Dept. BB, Walnut and Exchange Sts., St. Paul 2, Minn.

**SPECIFY**

# Hall...

## PRECISION LEVELS



**FIG. NO. 5** Adjustable type Machinists' Levels with ground and graduated vial. Grooved for use on shafting. Sizes 4", 6", 8", 12", 18".

"MANUFACTURERS OF  
SPECIAL LEVELS  
FOR ANY USE."

**FIG. NO. 50**—For setup and maintenance is accurate to 10 seconds. Graduations are in .0005" per foot. Packed in Instrument Case.

Address Orders or Inquiries to

## HALL LEVEL AND MANUFACTURING WORKS

(Established in Geneva, Ohio, in 1913)

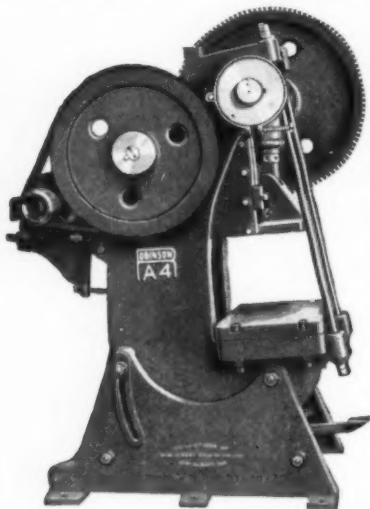
1119 E. 4TH

AUSTIN, TEXAS

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

241

## Long Recognized for durability strength and service



● The new improved Series A Robinson Punch Presses retain all the sturdy characteristics of their predecessors with added safety, speed, strength and ease of operation and maintenance. Available in five sizes.

Send for descriptive Bulletin No. 7.

**New Albany Machine Mfg. Co.**  
New Albany, Indiana, U.S.A.

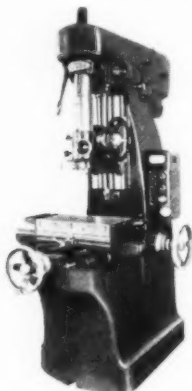


### MOORE ANNOUNCES LARGER JIG BORER

A new jig borer, Model No. 2, that extends the principle of accurate lead screws for precise table settings and provides for heavier cuts and larger holes, is announced by the Moore Special Tool Company, Inc. The No. 1 model will be continued in the line.

The new machine will jig-bore holes up to 5" in mild steel or cast-iron. It provides infinitely variable spindle speeds, push-button controlled, with a range from 90 to 2400 R.P.M. Three power feed ratios—.0015", .003" and .006" per revolution of spindle in either direction—constitute another feature.

Other advantages are: centralized control panel (and tachometer) for spindle speeds and one-shot lubrication; disconnect clutch for easy indicating; trip mechanism which prevents jamming of lead screw nuts through over-travel; totally enclosed drive mechanism with



no open belts or sheaves. The unit contains hardened, ground and lapped lead screws for precise, rapid table settings within .0001" by coordinate location; hardened, ground and lapped quill supported by hardened, ground and lapped bushings; pre-loaded super-precision ball bearing spindle with totally enclosed spindle and quill; all controls within easy reach of operator.

The No. 2 model specifications: table working surface, 10"x19"; table travel longitudinal, 16½", table travel crosswise, 10½"; table top to spindle end: minimum

**Now!**

**Genuine**



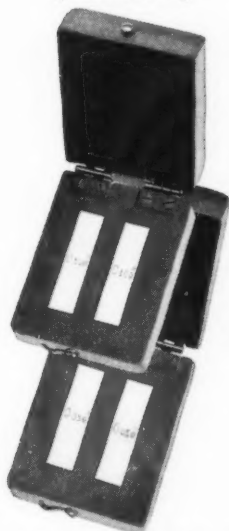
**Johansson**

*Sintered Tungsten Carbide*

**GUARD BLOCKS**

"A" Standard  
( $\pm .000004$ ")

"B" Standard  
( $\pm .000008$ ")



Protect your valuable Jo-Blocks with a pair or two of these new super-hard Johansson Guard Blocks! Simply wring them onto the ends of any Jo-Block combination and they'll fend off virtually all the impact and abrasion of any gaging job.

### **Practically Wear-Proof!**

Made of finest Sintered Tungsten Carbide, finished to Jo-Block brilliance and accuracy. Available in "A" and "B" standards, and in thicknesses of 0.100" and 0.050", cased in pairs or complete sets of four blocks, at very moderate cost.

**PATENTED AND WARRANTED BY FORD •  
TO PROTECT AND ENORMOUSLY LENGTHEN  
THE SERVICE LIFE OF YOUR**



**Johansson**

**GAGE**

**BLOCKS**



**FORD MOTOR COMPANY • JOHANSSON DIVISION**

**3606 Schaefer Road, Dearborn, Michigan**

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

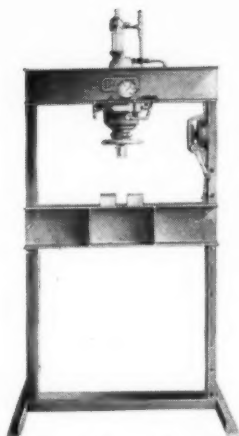
3", maximum 18"; vertical adjustment of quill housing 10"; spindle quill travel, 5"; spindle center to column ways, 10"; spindle center to below column ways, 11½".

Complete information regarding the No. 2 Jig Borer will be furnished upon application to the Moore Special Tool Co., Inc., Dept. BB, 728 Union Ave., Bridgeport 7, Conn.

### DAKE AIR-OPERATED PRESS

A new series of air-operated presses for tool and die shops and manufacturing plants is announced by Dake Engine Co. These new units offer increased speed and extra ease of operation, since the force is provided by air pressure. There are only two simple valves for the operator to manipulate to obtain the desired pressure.

The new air-hydraulic presses can be used wherever an air supply is available. They are furnished with either of two capacity pumps; one type provides rated tonnage of the press at 145 lb. air pressure, the other at 90 lb. air pressure. The press is equipped with a special safety valve to prevent overloading of equipment, regardless of the air pressure. An optional pressure control is available which can be regulated to provide any



desired pressure lower than actual line pressure.

The new series of presses are supplied in 25, 50, and 75-ton capacities. Additional data is available from Dake Engine Co., Dept. BB, Grand Haven, Mich.

**GET THIS VALUABLE KIT ABSOLUTELY FREE!**

*Write today!*

**GRINDING and  
LAPPING  
Compounds**

**6**

**LIBERAL JARS**

DIFFERENT  
GRADES

UNITED STATES PRODUCTS CO.  
PITTSBURGH, PA.

## SOLVE

### PRECISION LAPPING PROBLEMS

With this trial carton your own experience will tell you why these finer quality, finer grit compounds are right for all precision lapping. Carton contains six grades of compounds, all fine grit sizes best suited to a variety of work. Mailed postpaid anywhere in U.S.A. No obligation. Write today.

*Prove*  
**THEM ON YOUR  
TOUGHEST  
OPERATIONS**

*at Our Expense!*

**UNITED STATES PRODUCTS CO.**

518 MELWOOD ST.



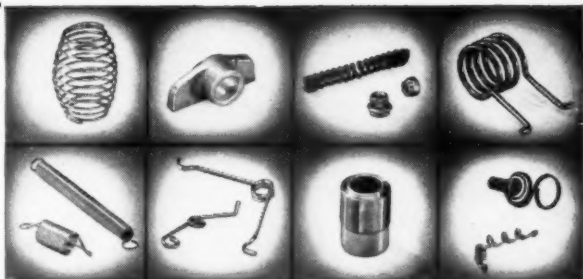
PITTSBURGH, PA.

## SPRINGS

## Wire Forms

and

## SCREW



### MACHINE PRODUCTS Precision Engineered

Devoted to the exclusive service of manufacturers, HAN-DEE makes springs of every type and kind, no matter how small, in any quantity. Competent engineers will assist you with unusual situations and make recommendations when desired.

Speed up your production the HAN-DEE way. A sample or blueprint will bring a prompt quotation. Immediate delivery; close attention; low cost.

Facilities for machining castings and small assemblies.

**THE HAN-DEE SPRING and MANUFACTURING CO.**

2070 PARK STREET

HARTFORD, CONNECTICUT

## MODEL No. 16 "SPECIAL"

CONSTRUCTED AS PER SPECIFICATIONS OF U. S.

NAVAL AIRCRAFT FACTORIES

### BUTTERFLY FILING and SAWING MACHINE

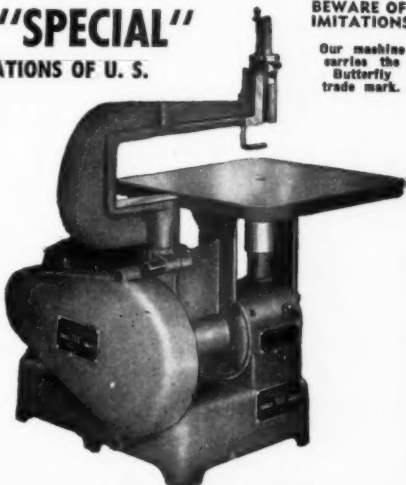
(Die Making Machine)

This is a very heavy, powerful machine and is designed for extra heavy filing and sawing, but it performs small work just as well. This type of machine is usually adopted in Ammunition Plants, Airplane Factories and machine shops where heavy and precision filing and sawing is desired. We also manufacture smaller models—Model D—10" Table; Model E.L.—12" Table. Model No. 14—14" table and heavy pedestals for all our machines.

**HARVEY MFG. CORP.**

161 GRAND ST., NEW YORK

Phone CANal 6-5170



**BEWARE OF  
IMITATIONS**

Our machine  
carries the  
Butterfly  
trade mark.

Registered U. S. Patent Office

### NEW "STANDARD" AUTOMATIC SCREW MACHINE

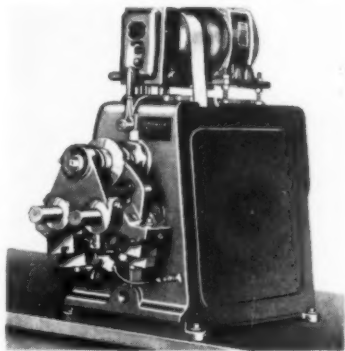
This Automatic Screw machine is of compact size, set up on 24" spindle centers; it has high production rate, quick chucking and cam shift speed up; and a chip breaker, designed on the principle of harmonic vibration; operating efficiency, with all tool settings, cam adjustments and controls accessible at front of machine.

The method of driving the feed cam shaft prevents the formation and clogging of long chips, of particular importance in working plastics and other materials forming long, troublesome chips. Twice in each revolution of the spindle, the rotation of the feed cam shaft is interrupted, effecting an intermittent feed, breaking each chip as it is formed. The motion of the cam shaft does not stop entirely, but vibrates within an amplitude sufficient to break each chip.

The machine performs two forming operations—a roughing cut followed by a finishing tool and a cut-off; it accommodates bar stock up to 1" diameter.

Control and movement of tools are provided at easily selected rates, and

without gearing. Feeds are adjustable in small increments within the unit's capacity. The feed cam shaft can be disengaged instantly and rotated slowly by hand for the setting of tools. Holders for



all types of tool shanks, as well as special attachments for drilling and boring, are available. The tools are reset against adjusted stops provided in the holder.

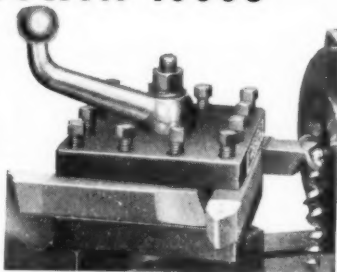
## ACCURATE WITHIN .0005

### Enco LATHE TURRETS

Enco Lathe Turrets re-index to the same position within five ten thousandths. Piece after piece can be machined with complete confidence in production precision.

There are no pins or bushings in Enco Toolpost Turrets to wear "egg shaped" or out of alignment. This ability to "come back" accurately makes Enco users come back for more turrets.

Mention your lathes, swing and tool size, when you ask for the "30 Models Catalog"



- 12 POSITION INDEXING
- 3 WORKING POSITIONS FOR EACH TOOL
- HARDENED STEEL CONSTRUCTION
- MOUNTS RIGIDLY IN COMPOUND T-SLOT
- KEEPS SETTING ACCURATELY
- INDEXING IS SELF-CONTAINED. ELIMINATES ALL CHIP INTERFERENCE

## ENCO MANUFACTURING COMPANY

Dept. 212 — 4522-24 W. Fullerton Ave., Chicago 39, Illinois

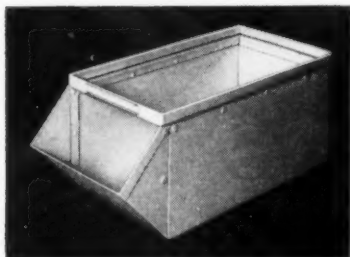
The "Standard" Automatic performs in shorter cycles, producing more pieces because of its quick chucking and cam shaft speed-up. Bar stock is readily introduced to the feed tube by the operator from the front. Butt ends of bar stock are ejected by manual control.

Regular equipment for this unit includes a 1½ hp motor with a manual starter and a motor sheave arranged for a spindle speed of 900 rpm, unless otherwise specified. The Standard Machinery Co., Dept. BB, 1555 Elmwood Ave., Providence, R. I.

#### **RUGGED, LIGHT WEIGHT ALUMINUM STACKBINS**

The Stackbin Corp. announces an addition to their regular line of steel portable containers, consisting of Stackbins built of heavy-gauge aluminum. These latest additions are strong and light in weight, being only one-third as heavy as steel.

The new Stackbins are individual hopper-fronted stacking bins designed for



storage, transportation and assembly of tools, parts and materials. Stored in Stackracks, the Stackbin units are instantly accessible when contents are needed—without disturbing any other bin. The Stackbin Corp., Dept. BB, Pawtucket, R. I.

#### **VELSEY GRANITE SURFACE PLATES**

**IMMEDIATE DELIVERY  
ON STOCK PLATES  
OTHER SIZES ON REQUEST  
10 YEAR WARRANTEE**

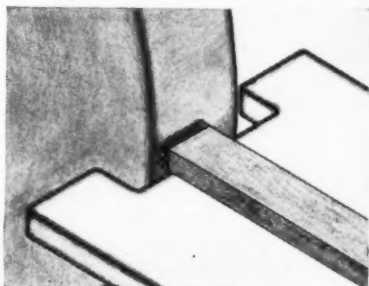
**THE ELKRO CO.**

181 SALEM AVE., DAYTON 6, OHIO

## **NEW!**

### **AREA-TYPE DRESSERS**

**Save Time — Lower Cost**



#### **"STEELSET" (sintered steel)**

**Impregnated diamond, area-type  
free-hand and machine  
dressing and truing**

**For coarse and fine finishes.**

#### **SPEED AND ECONOMY BY:**

- Simultaneous action of large number of cutting points.
- Simultaneous dressing and truing by matching dresser grit to wheel grit.
- Use of less expensive diamonds.
- Elimination of resetting.
- Wet or dry operation.

#### **FREE-HAND DRESSERS — 7" HANDLE**

1/2" Impregnation Diamond Face 3 1/2" x 3/16"	...\$22.50
1/2" Impregnation Diamond Face 1 1/2" x 3/16"	...\$37.50
1/16" Impregnation Diamond Face 3 1/2" x 3/16"	...\$22.50
1/16" Impregnation Diamond Face 1 1/2" x 3/16"	...\$37.50

#### **MACHINE DRESSERS — Prices on request**

**Write for Bulletin DT-323**

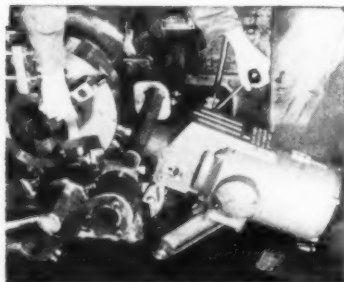
**FISH-SCHURMAN CORPORATION**  
230 East 45th St., New York 17, N. Y.

**Fish-Schurman**



## AUTOMATIC WRENCH

A new automatic wrench, consisting of a variable torque motor operating a retractable spindle, is announced by the Fen Machine Co., 1350 Babbitt Rd., Dept. 24, Euclid, Ohio. The wrench is available in two models with maximum torque capacity of 4000 inch lbs., and 6000 inch lbs. respectively. A selector wheel on the side of the housing enables the operator to select and hold any desired torque from 0 to the maximum capacity of the unit. This regulates the gripping pressure, allowing a light pressure for thin walled pieces and a heavy grip for heavier



work. The downward movement of a hand control lever engages the wrench spindle in the chuck pinion. Left and right movements of the same lever operate a momentary switch which energizes the motor for gripping or releasing the workpiece. A positive action brake applies to either direction of motor operation, preventing overrun. In four jaw chucking, each jaw may be advanced or retracted and the movement held within close limits. The operator can also "jog" each jaw until the proper working position of the workpiece is attained.

Overall dimensions for model 4M, 4000 inch lbs. torque capacity are: length 22 $\frac{3}{4}$ ", diameter 7 $\frac{1}{2}$ " for the model 6M, 6000 inch lbs. torque capacity, length is 25-13/16", diameter 9". Model 4M is recommended for use with chucks up to and including 12" diameter; and model 6M is recommended for use with chucks 15 to 30" in diameter. Models are provided with motors of 220 or 440 volts, 60 cycle, 3 phase. Spindles are provided to fit chuck sockets as specified.

## SINGLE PHASE MOTORS FEATURE NEW BRADFORD GRINDERS

The Bradford Machine Tool Co. announces production of a new line of "Metalmaster" bench and pedestal type grinders and buffer-polishers, equipped with full one horsepower, 110-220 volt, 50/60 cycle, single phase motors. Known as the "190" series, these Bradford tools are designed to meet job requirements of small shops and maintenance departments, having single phase electric power supply.

Eleven tool models make up the "190" series. Model 190 is a double wheel



pedestal grinder; Model 191 (illustrated) is a combination grinder and buffer on a pedestal mount. Both models have a wheel diameter of 12 inches. One fine and one coarse grinding wheel are supplied with the Model 190 Grinder, and a single fine grinding wheel with the Model 191. Standard equipment for both tools includes safety glass eye shields, spark breakers, tool tray and water pot. Spindles are of chrome nickel steel, mounted on ball bearings. Wheel guards are adjustable radially and are equipped with hinged doors providing quick wheel change. Models 190 and 191 are also available with bench type bases and are listed as Models 190B and 191B.

All motors used in the Bradford "190" series of single phase tools are totally enclosed to N.E.M.A. specifications, and are equipped with push button type switches.

# SPRING & PRESSES

## POWER AND FOOT OPERATED

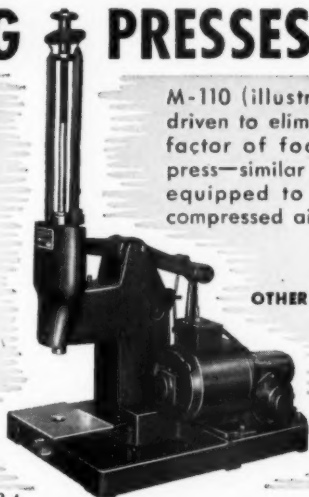
For riveting, staking, stamping and similar operations on small light parts. Constructed to compensate for variation in thickness of the work and to deliver a UNIFORM BLOW AT EVERY STROKE.

Send for Bulletin



EST. 1834

**THE TAYLOR & FENN CO.** HARTFORD 1, CONN.

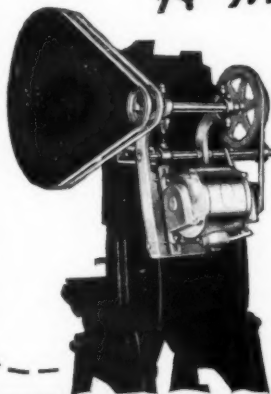


M-110 (illustrated) motor driven to eliminate fatigue factor of foot operated press—similar press M-130, equipped to operate by compressed air.

## OTHER T & F MACHINES

Duplex Spline  
Millers — Medium Duty and  
High Speed  
Sensitive Drilling  
Machines.

## A Modern



## MOTOR DRIVE FOR EVERY MACHINE TOOL

The Modern Motor Drive shown here fills an urgent demand for an easily mounted economical Punch Press Drive.

Utilizing the jackshaft principle, permitting the use of standard 1750 R.P.M. Motors.

Brackets for direct drive from motor to flywheel are also available from stock.

Write for catalog showing complete line of Modern Drives for other machine tool equipment.

**THE NICHOLS ENGINEERING COMPANY...**  
2400 W. MADISON ST. CHICAGO 12, ILL.

An attractive four-page folder illustrating these tools and giving complete specifications will be supplied on request. Write for Bulletin No. 116 to The Bradford Machine Tool Co., Dept. BB, 657 Evans St., Cincinnati 4, Ohio.

#### USEFUL FLEXIBLE SHAFT TOOL KIT

A new Flexible Shaft Tool Kit, designed for industrial commercial, and home use, where a wide range of speeds is required has been developed by the Flex-O-Shaft Sales Co. Any desired speed may be selected by a quick method of speed change. The unit is light-weight, with an aluminum hand-piece. It is provided with three collets for standard  $\frac{1}{8}$ " and  $\frac{3}{32}$ " shank-mounted wheels, and will accommodate drills and special tools from  $\frac{1}{8}$ " to .028" diameter. The tool head is small in diameter, enabling it to reach usually inaccessible points.



The hand-piece is designed for maximum efficiency, according to the manufacturers. It is equipped with a precision ball bearing at the chuck end, of more than ample load capacity both radial and thrust. The bearing is shielded for grease retention and protection from chips. The motor capacity is  $\frac{1}{16}$  HP., with 6000 RPM speed at full load, and 13000 RPM no load; 110-120 volts, AC or DC. The kit contains an assortment of 66 of the most popular tools as accessories, packed in a wooden cabinet. An illustrated booklet describing the tool kit will be sent upon request to the Flex-O-Shaft Sales Co., Dept. BB, Prairie View, Ill.

#### NEW SCHAUER POLISHING LATHE

Providing an advanced method for polishing and finishing stainless steel, copper and aluminum products and utensils, this new Schauer Speed Lathe, with vacuum-type holding fixtures, makes possible the fast polishing of the entire surface of the object with an even lustre.

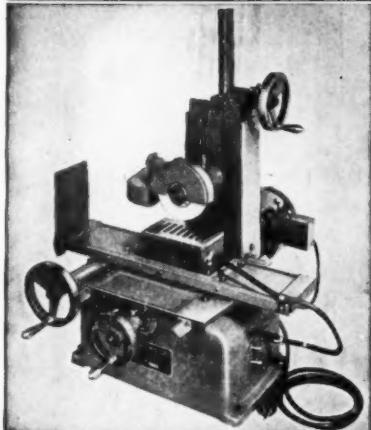


With this machine, the part itself is revolved, instead of bringing it up to a revolving abrasive or polishing wheel. The part is held in the fixture by vacuum. Various types and sizes of vacuum holding fixtures may be provided, depending upon the size and shape of the parts to be finished. This type of fixture will not mar nor distort the part, even though the latter may be very thin.

The machine may be equipped for either hand or foot operation of motor and brake control. The brake is applied automatically the instant the power supply to the motor is cut off. Breaking is smooth, stopping the motor quickly at high speed, a factor which contributes to the machine's high rate of production.

This Speed Lathe is known as Type NA2B-V, and is made by the Schauer Machine Co., Dept BB, 2064 Reading Rd., Cincinnati 2, Ohio.

# SANFORD



## High-Speed BENCH SURFACE GRINDER

ACCURATE WITHIN .0001

A sensitive machine built to rigid standards of accuracy and workmanship specially designed "For the job that fits in your palm."

WRITE FOR BULLETIN

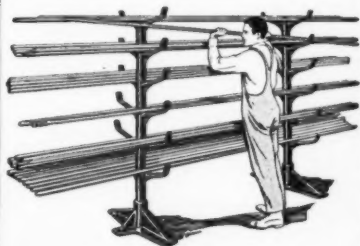
**SANFORD MFG. CO.**

1020-28 Commerce Ave.

Union, N. J.



Each BROWN SECTIONAL RACK combines five major and several minor features of design, all of which save money for its owner. The time previously lost in end-hauling each bar of stock its entire length from the old-style, closed-side Rack is saved by the Brown Rack which requires but a few inches of side movement.



Each length, width and thickness of stock is displayed in Gold-Fish visibility for instant selection and workmen waiting for stock are served without waste of time. The BROWN SECTIONAL RACK is a simple, durable article built in five styles from standard interlocking metal sections. It cannot burn, sag or twist; unattached to the building, it can be moved at will. Changes in length of stock can be met by moving the units nearer or further apart, while increases of stock can be met by simply adding more standard units. Built from metal throughout, depreciation is practically nil. SEND FOR BULLETIN NO. 26-B.

## BROWN SECTIONAL RACK

**BROWN ENGINEERING CO.**

126 N. THIRD ST. READING, PA.

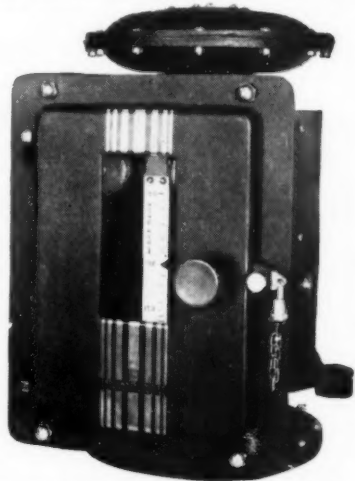
RACKS • VISES • CLUTCHES • COUPLINGS

### AIR-FUEL RATIO CONTROLLER FOR INDUSTRIAL FURNACES

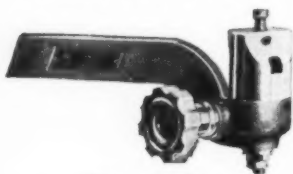
Temperature and combustion control systems manufactured by Leeds and Northrup Co. for large industrial furnaces now include a new Air-Fuel Ratio Controller which, according to the makers is simple in operation, accurate, and sensitive in control. It uses electric-motored valve drives, thus requires no hydraulic piping.

The Ratio Controller is a rugged, balance-type instrument, easily mounted on the furnace panel; it has ample flexibility

to meet any operating condition. Its ratio can be adjusted manually for operation with fuels of various BTU content. As the fuel flow changes, the instrument maintains the air-fuel ratio constant at the desired control point. It can also



### Monarch Precision SHAPLANE Radius Tools



*Patent Pending*

For Lathes, Shapers, Planers, Boring Mills, etc. Min. Rad.  $\frac{1}{2}$ " to Max. Rad.  $2\frac{1}{2}$ ". Made in 3 Models.

**C. B. TEETER**  
Machine Specialties  
4470 Oakwald Ave., Chicago 15, Ill.  
Phone Drexel 3571

provide automatic variation of ratio, increasing or decreasing the percentage of air at reduced fuel flows.

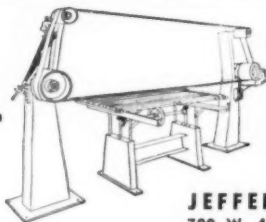
Further information will be sent on request to the Leeds and Northrup Co., 4934 Stenton Ave., Dept. BB, Philadelphia 44, Pa.

### METAL GAUGE COMPARATOR CHART

A Metal Gauge Comparator Chart, published by Twin "K" Products, 2322-44 Newport Ave., Dayton 5, Ohio, gives the equivalents of metal gauges in thousandths, fractions, millimeters, mils, and

•  
**Save  
Time**

**Save  
Money**  
•



### JEFFERSON Endless Belt Sanding Machine

Eliminate waste of time and money. Do away with manual handling. This machine finishes wood surfaces to satin smoothness at 5,000 surface feet per minute. Large flat, convex or concave surfaces.

ORDER TODAY FOR 3 WEEKS DELIVERY  
REPRESENTATIVES: WRITE FOR  
MONEY-MAKING DEAL

**JEFFERSON MACHINE TOOL CO.**  
700 W. 4th ST. CINCINNATI 3, OHIO

circular mils. The gauges so interpreted are Sheet Lead, Sheet Zinc, Sheet Copper, Birmingham (Stubs), American (B. & S.), U. S. Standard (old), U. S. Standard (new), U. S. Steel Wire (formerly W. & M.), Piano Wire (Am. S. & W. Co.), British Standard (Imperial), and Stubs' Steel Wire. Measurements are shown up to  $\frac{1}{4}$ " in increments of .001". An index tells which gauges are applicable to the various classes of sheets, wires, rods, and tubes. One use of the chart is to avoid misunderstandings by specifying thickness or diameter in addition to gauge numbers. The chart is 23" x 10½" in size, printed on heavy cover stock. It is offered in quantities, with imprint, to manufacturers who wish to present it to customers as a good-will item.

#### VERI-TELL PYROMETRIC INDICATOR

The Taco West Corp. has developed a new series of Precision Control Indicators added to their line of Automatic Electronic Control Equipment. Marketed under the trade-name of Veri-Tell, the line includes the Model "T", a millivoltmeter pyrometric Indicator, thermally compensated, including Briquet (Thermostatic) Automatic Cold Junction correction.

The Model "H" millivoltmeter pyro-

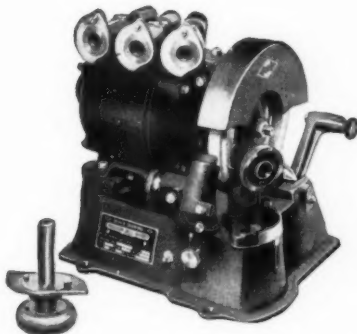


metric Indicator establishes a high level of measurement accuracy by utilizing the newly developed Hypar compensator which derives its operative energy from a convenient line supply. Fully compensated for all instrument errors, these higher measurement accuracy devices are especially useful in chemical processes, laboratory measurement, thermal analysis problems, applications where unusually narrow or negative scale ranges are required.

These instruments are also available for voltmeter, ammeter, wattmeter, and ohmmeter usage. Write for Bulletin M-1; the Taco-West Corp., Dept. RS, 2620 S. Park Ave., Chicago 16, Ill.

## BLACK DIAMOND DRILL GRINDER

PRECISION  
SPECIFICALLY  
FOR SHARPENING SMALL  
GAUGE & FRACTIONAL DRILLS



**WHETHER** you use drills singly or in gangs—by hundreds or thousands—this moderately priced machine—motor driven—will keep any supply sharp and quickly available.

Anyone can operate a Black Diamond. Even the most inexperienced can keep all small drills sharp—and true centered, with smooth lips accurately ground to exactly the same length—at the proper angle and with correct clearance for fast, precision drilling.

Black Diamond Grinders cut 50% and more on drill grinding costs, sharpen without waste of expensive drill stock, reduce drill breakage and work spoilage to a minimum.

The Diamond Point Dresser keeps the grinding wheel ever-sharp cutting and the Web Thinning Attachment cares for all types of Notched points to perfection.

WRITE FOR COMPLETE DETAILS TODAY.

**BLACK DIAMOND SAW & MACHINE WORKS, INC.**  
45 NORTH AVENUE • • NATICK, MASSACHUSETTS



## MECHANICAL MUSCLES

### FOR EVERY LIFTING AND CARRYING JOB

Install PORTELEVATOR. The Hamilton portable elevating table. One man can safely lift and carry loads previously requiring the strength of four.

Raises, lowers, transports. Three table surfaces. Accessible from four sides. Four point support. Standard model capacities, 1,000 to 5,000 pounds. Special models built on order.

Write for Bulletin P-47.



### FLEXIBLE MONEL TUBING WITHSTANDS HIGH TEMPERATURES

Flexible metallic tubing made from monel metal for use where severe corrosion or high temperatures are encountered, has just been announced by Titeflex, Inc., 639 Frelinghuysen Ave., Newark 5, N. J. This product is recommended for flexible tubing applications where the corrosion resisting requirements cannot be met by brass tubing, or where the temperature of operation is about 300° F. Monel metal was selected for the new tubing because it successfully resists the attack of mineral and organic acids, alkalies, and salts over a wide range of concentration and exposure conditions.

Titeflex monel metal flexible tubing is supplied for four temperature ranges, the specific range depending upon the melting point of the solder used in the seam of the innercore. In the table below is given the type number which is used to indicate the temperature range of the solder used in the seam and the melting point of these solders.



Type No.	Solder Melting Point	Solder Flow Point
S-175	358°F.	460°F.
S-176	640°F.	740°F.
S-129	1076°F.	1179°F.
S-196	1785°F.	1790°F.

Because of its suitability for high temperature operation, Titeflex monel metal tubing can be used in both high and low pressure steam lines. In addition the monel metal tubing has proved stronger

than brass in breaking test. Titeflex monel tubing is supplied in the same sizes and with the same types of fittings as the standard Titeflex brass flexible tubing. It is furnished with either single or double bronze braid and brass fittings. Where special conditions require, monel fittings and monel braid can be supplied.

#### INGERSOLL-RAND JACKHAMMER HAS MANY USES

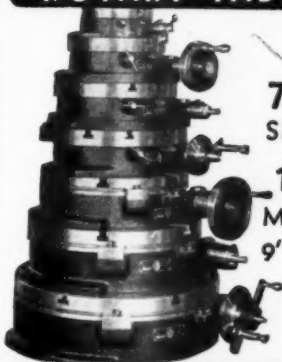
A new rockdrill, designated as the J-10 Utility Jackhammer, has been announced by Ingersoll-Rand. The drill is designed and built for general utility and plant maintenance work. According to the manufacturers, the J-10 will do many drilling jobs in construction and maintenance work; its light weight and ease of handling make it ideal for portable use and overhead work.



The J-10 has powerful automatic rotation, and is equipped with standard Jackbits. By using adapters, star drills can be used to drill holes  $1\frac{1}{8}$ " and under. By using round shanked tools, or by removing the rotation pawls, it can be used as a light paving breaker or for chiseling and channeling. A built-in oil reservoir in the handle supplies the lubrication.

Throttled control permits the selection of the precise type of concussion for the various types of work or tool, which can be handled by the unit. It is claimed that the number of uses to which the Jackhammer can be put is limited only by the ingenuity of the user. Complete information on the J-10 will be supplied upon request to the Ingersoll-Rand Co., Dept. BB, Phillipsburg, N. J.

#### SAVES TOOL MAKERS' TIME TROYKE ROTARY TABLES



7  
SIZES  
10  
MODELS  
9" to 25"



Catalog on request  
**TROYKE MFG. CO.**  
4422 Appleton St., Cincinnati 9, Ohio

**Immediate Delivery!**

**New! 15" BUFFALO**

## DRILL PRESSES

Bench & Floor Models with  $\frac{1}{2}$ "  
Jacobs chuck—1/3 H.P. Single  
Phase Motor

**At Factory  
LIST Prices**

Phone, wire, write

**DAVIS MACHINERY CO.**  
126 N. CLINTON ST., CHICAGO 6, ILL.

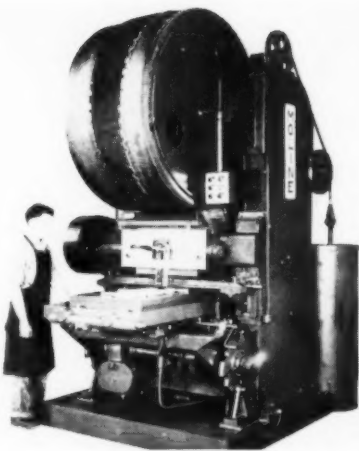
## MOLINE 29-SPINDLE AUTOMATIC DRILLING MACHINE

The Moline CF140 special 29-spindle machine for automatic drilling of aluminum header plates was designed and built for the purpose of drilling all of the holes in aluminum header plates which are used in head transfer equipment for aircraft.

Some of the plates to be drilled are of a shape which approaches an ellipse, whereon the major axis of the drilled area is about  $25\frac{1}{4}$ " and the minor axis is approximately  $13\frac{3}{4}$ ". In this area approximately 3700 holes of slightly less than  $\frac{1}{4}$ " diameter are drilled in rows where the center to center distance from one hole to the next is just  $\frac{1}{4}$ ". The rows of holes are spaced slightly less than  $\frac{1}{4}$ " from the center line of one row to the center lines of adjacent rows and the holes are staggered from one row to the next. Also, there are wider row spacings at intervals to allow room for the insertion of baffles. The plates are stacked in pairs and one pair is drilled during a complete operating cycle of the machine.

The machine, as shown by the cut, is equipped with a method for automatic spindle selection, which is synchronized with the indexing of the work table. The spacing of the spindles is such that every third hole in a row is drilled at one pass of the drills. Thus the table must index sideways twice to complete the drilling of each row of holes. It will be noted that the spindle selector drum has no motion either vertically or horizontally, but is indexed so that it turns on its horizontal axis at each pass of the drills. Each indexing motion brings a new row of holes in the spindle selector drum into position directly above the drill spindles. The work table on which the pair of plates to be drilled is mounted is moved up and down by cam action to produce rapid traverse and feed.

On the same slide with the table is mounted the rail which carries the drill spindles. Thus, when the table moves upward, the drill also move upward at the same rate. At the point where feed begins and the upper ends of the spindles reach the drum, the upward motion will end for any spindle which contacts a plug that has been inserted in the hole in the drum which happens to be di-



rectly above that particular spindle. Consequently, as the table continues to feed the work upward the selected spindles will drill holes. After any one row of holes is completed, the work table moves at right angles to the rows of holes in order to locate the work in readiness for drilling the holes in the next row.

This routine is continued with the spindles being selected and the indexing of the work both sidewise and from row to row of holes until all required holes have been drilled. Then the machine stops automatically.

It is the claim of the manufacturer that the installation and use of this machine has resulted in making one operator more than fourteen times as productive than was possible by means of the method used prior to installation of the machine.

Complete information on the Automatic Drilling Machine is available by writing to the Moline Tool Co., Dept. BB, Moline, Ill.

### EXTRA-SMALL CHROME-STEEL BALLS

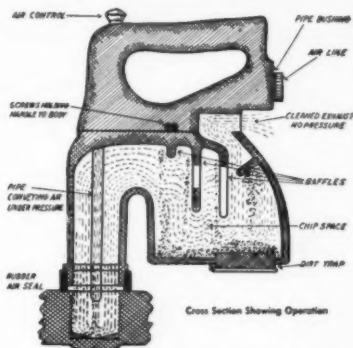
As an addition to their regular group of Micro Ball Bearings, an newly developed line of extra-small precision grade steel balls, in sizes 1 mm (.0394") and  $\frac{3}{64}$ " (.0469") diameter, is announced by New Hampshire Ball Bearings, Inc.

Although only about half the size of a

# IT'S HERE!! THE BUFFALO PNEUMATIC CHIP GUN

**A NEW METHOD OF REMOVING  
CHIPS FROM BLIND DRILLED AND  
TAPPED HOLES.**

Eliminate the danger to your workmen from flying chips by removing your cuttings with the **BUFFALO PNEUMATIC CHIP GUN**. Simply place the nozzle over the hole, release the air by thumb pressure and the cuttings are deposited in the body of the gun.



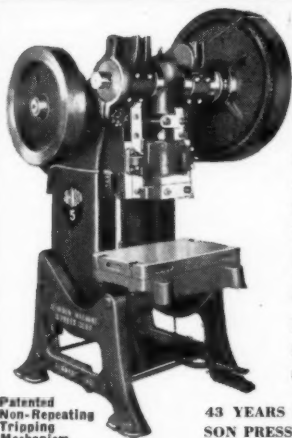
**SAFE!**

**LEAN!**

**EFFICIENT!**

Write for Bulletin No. 1011 today

**BUFFALO MACHINERY CO., INC.**  
838 Grant Street  
Buffalo 13, New York



Patented  
Non-Repeating  
Tripping  
Mechanism

## UNLIMITED PEAK PRODUCTION

Much larger die space than average presses. Engineered and designed for unlimited peak production.

Reinforced construction at points of greatest wear.

If you want the best, send for illustrated catalog describing complete line TODAY.

*With Modern*



43 YEARS ENGINEERING EXPERIENCE BUILT INTO EVERY JOHNSON PRESS USED BY LEADING MFR'S. THROUGHOUT THE WORLD.

**JOHNSON MACHINE AND PRESS CORP., ELKHART, INDIANA**

pin head, these high-carbon chrome alloy balls are held to a size tolerance of plus or minus .00005", and superfinished to a surface within 20 millionths of a perfect sphere. Their manufacture, involving gauging and inspection processes usually confined to the laboratory, has been brought to a production level.



Applications include anti-friction bearings, ball-pens, instruments, chemical processes and a variety of industrial uses. For further details, write New Hampshire Ball Bearings, Inc., Dept. BB, 1 Granite St., St. Peterborough, N. H.

#### NEW SULPHUR-CHLORIDE CUTTING OIL ADDITIVES

Lubricants Inc., Fisher Bldg., Detroit, Mich., announce two new cutting oil additives—Cresol Z-2 and Cresol Z-2A, designed to assist in the production of cutting oil coolants, drawing compounds, metal rolling, forming and extreme pressure lubricants.

They are adapted to the machining of S & C Steels, Monel Metal, Chrome, Chrome Molybdenum, Chrome Nickel, Tungsten and the so-called stainless steels. Cresol Z-2 and Cresol Z-2A are modified sulphur-chlorides and contain as high as 40% sulphur and 30% Chlorine. When added to light mineral oils in percentages from one to four % they make possible the production of cutting oils of high metal cutting ability.

The products are very stable, do not stain ferrous metals and do not gum or decompose when used as suggested. They will not cause, but prevent skin infection. The uses of Cresols for machining, drawing, stamping, forming and rolling,

reduces inventories on cutting oil items, and establishes efficiencies to meet operating conditions indicated.

#### TUMBLING BARREL PROVIDES SAFETY FEATURES

The new Murco Tumbling Barrel, announced by D. J. Murray Manufacturing Co. claims special features of interest to manufacturing plants that debur, burnish, clean, polish and smooth-surface metal and plastic parts on a mass production basis. A compact unit, the Murco Tumbling Barrel is simply designed for low maintenance. Speed changes may be effected while the barrel is in motion, allowing a wide range of speeds to meet various operating conditions and requirements.



The unit is equipped with specially designed dump pans which are mounted on casters, and are provided with a bail handle notched for crane hook. The discharge end of the pan is funnel shaped, which fits in the compartment opening to facilitate loading. Separating screens of various mesh wire can be mounted in frames to fit dump pans. All moving parts such as the barrel, gears, pulleys and motor, are protected with guard rail, steel enclosures, and concealed design for safety of operation. While the frame and barrel are light weight they are designed and built to withstand heavy duty service. Complete information on the Murco Tumbling Barrel is available from the D. J. Murray Manufacturing Co., Dept. BB, Wausau, Wis.



## This PALMGREN

No. 000 ANGLE VISE for MILLING-DRILLING-GRINDING Etc.

Solve Difficult Angle Jobs. Get QUICK, ACCURATE, SET-UPS and save time, money, rejects. Accurately machined and graduated to full 90°. Also use horizontal. Steel Jaws 2½" plain or grooved. Immediate Delivery -

## Combination Can't Be Beat!

No. 250 MILLING ATTACHMENT Convert Lathe in 10 Seconds!

Mill, Slot, Grind, Groove, Square Shafts, Saw at Angles, Hecress Etc. on LATHE. Precision built—90° graduation for rotary angle and graduated vertical feed screw.



Fits all lathes—straddles tool post.

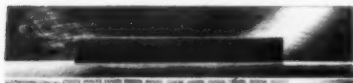
Phone Saginaw 8675

CHICAGO TOOL & ENGINEERING CO.  
8384 South Chicago Ave. Chicago 17, Ill.

## TUNGSTEN CARBIDE CENTERLESS GRINDER BLADE

Combining the hardness of tungsten carbide with the strength of steel, the Clifco centerless grinder work rest blade has been introduced by The Clifco Co., 17 North Leclair Ave., Chicago 44.

Proved in actual industrial grinding operations for more than a year before announcement, the Clifco blade has reduced work-hour blade-cost as much as 85% in some operations. Design of the new blade features at the wearing surface sectional inserts of tungsten carbide



or tool steel could be used in the past. In addition, it lasts many times as long as a straight tungsten carbide blade on other types of operation, such as finish grinding.

Principle of the blade's construction and operation is three-fold (1) the supporting separators and steel walls around the tungsten carbide inserts prevent chipping on jobs where brittleness makes ordinary tungsten carbide blades useless; (2) the supporting walls also permit the use of a tungsten carbide (grade CA-4 Carmet) much harder than has ever before been used, thus providing even greater abrasion resistance; and (3) the supported construction makes it possible to lay the tungsten carbide surface four times as deep as on ordinary blades, thus permitting many more resurfacings.

## PRODUCTO PUNCH HOLDER REMOVER

separated by thin strips of a specially-developed alloy and laid in a slot with supporting walls of steel.

Thus reinforced, the blade provides a tungsten carbide surface for rough grind and other operations where only chilled

The Producto Machine Co. announces a new product, the Producto Punch Holder Remover, which is claimed to facilitate the removing of die punch holders from die beds with guide pins, and the separation of assembled punches and dies. In addition it may be used for shear-

## OILY FLOOR TROUBLES STOPPED with FULLERS EARTH!



An oil and grease absorbent that replaces sawdust or wood shavings. Lessens fire hazard! Stops accidents due to slipping on oil or grease! Low priced — economical — safe! Write for FREE SAMPLE or ask for trial order at quantity price!

**TAMMS SILICA CO., 228 N. La Salle St., Chicago 1, Ill.**



## Save Space and Lifting

Yohé Racks take less floor space—hold more stock and require less lifting. Four arm rack, 51" high stacks, 10,000 lbs. Five arm rack 57" high holds 12,000 lbs. flat or round stock—at safe lifting heights. Use against wall or back-to-back in center of room.

Let us send details and prices.

**WM. S. YOHE SUPPLY CO.**

503 Mahoning Rd., N.E. Canton, Ohio

ing in small punches and dies and try-out work on light gauges of material.

Punch holders are quickly and easily removed, avoiding damage to expensive punches and dies, with considerable saving of die maker's time. A descriptive bulletin is obtainable from the Producto Machine Co., Dept. BB, Bridgeport 1, Conn.

## MODEL 4 AMES HARDNESS TESTER

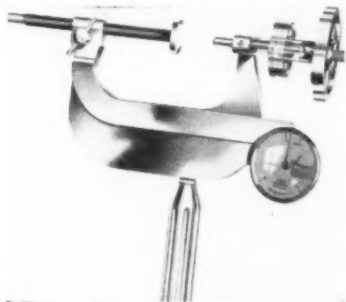
A portable hardness tester weighing slightly over three pounds and reading directly in the Rockwell hardness scales is offered by Ames Precision Machine Works. Rounds and flats, both hard and soft, up to four inches in capacity are tested quickly and accurately with the new Model 4.

The frame resembles that of an ordinary four inch micrometer and is sprung slightly when pressures are applied to the penetrators by turning the handwheel. A diamond penetrator is used for testing hardened steel, and ball penetrators for testing soft materials, as specified in the Rockwell chart. A lever extends across the front of the frame which actuates the dial indicator when pressures are ap-

# SMALL GEARS

FINE PITCH GEARS  
RATCHETS, PINIONS, SPROCKETS ETC.  
**New England Gear Works**  
PLANTVILLE, CONNECTICUT

plied and released. The indicator dial has graduation lines showing pressures of 60, 100, and 150 kilograms. Rockwell readings are taken from the graduated barrel dial which is located beneath a lucite magnifier for easy reading. The hardened anvil is threaded into the frame



and adjusted to accommodate different sizes of work. Ames Precision Machine Works, Dept. BB, Waltham 54, Mass.



- Runs cool and yields under load to compensate for work expansion

- Same dimensions as standard solid centers

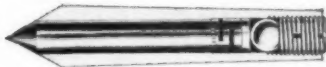
## REVOLVING TIP LATHE CENTER

LOWEST PRICED "LIVE" CENTER ON THE MARKET.

**\$6.25**

- No. 2 Morse Taper Shank
- No. 3—\$7.75
- No. 4—\$9.75 Morse Taper

ASK YOUR  
DEALER  
FOR  
DETAILS

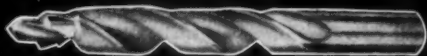
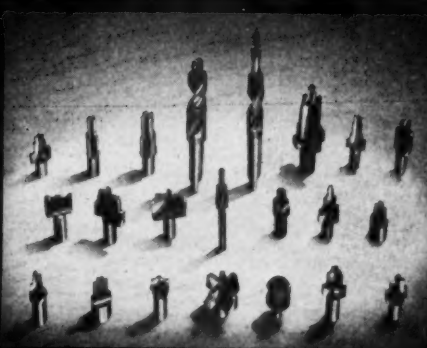


**ERNEST H. VANDERWALL COMPANY**

440 GOLDEN GATE AVE.  
SAN FRANCISCO 2, CALIFORNIA

# Spiral PRECISION TOOLS . . .

Make your tooling problem ours. We are equipped to make cutting tools of all kinds to YOUR SPECIFICATIONS, or our engineers will design the proper tools to do your job. YOU CAN BANK ON OUR DELIVERY PROMISE. We make Eccentric Relief Cutting Tools, Carbide-Tipped Cutting Tools, Step Drills, Step Reamers, etc. Tolerances are maintained exactly. Send us your sketch or blue print for quotation. If it is a Cutting Tool We Make It.



**SPIRAL MANUFACTURING CORP.**  
3612 NO. KILBOURN AVE. CHICAGO 41, ILLINOIS



# LINLEY

FOR NOISELESS, HIGH SPEED RIVETING

Rotary spinning principle shapes uniform heads, silently . . . capacities up to 3/8 inches diameters. Adjustable spindle stroke, controlled pressure . . . double row radial thrust bearing supports spindle, assures long life. Table elevating screw prevents slipping. Six floor or space-saving bench models . . . sturdily built for trouble-free operation under severe production schedules.

FOR COMPLETE INFORMATION,  
WRITE FOR BULLETIN.

**LINLEY BROTHERS CO.,** 663 STATE ST. EXTENSION  
BRIDGEPORT 1, CONNECTICUT

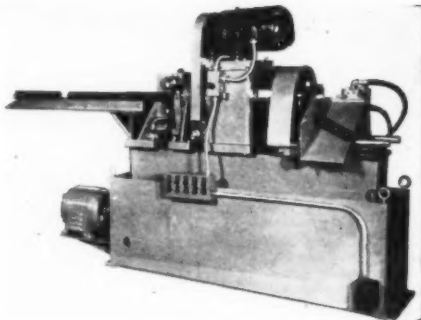
When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

## PINES AUTOMATIC CUT-OFF MACHINE MAINTAINS FINE TOLERANCES

Increased production and accuracy of cut lengths of pipe and tubing are features of the new and fully automatic Pines Cut-Off Machines. The work is fed by motor driven rolls through a hollow spindle and against an adjustable receding target stop. A rotating head automatically cuts the work to required length producing a square face and holding end-to-end dimensions to within a few thousandths. The head is tooled to produce a clean cut with a minimum of burrs.

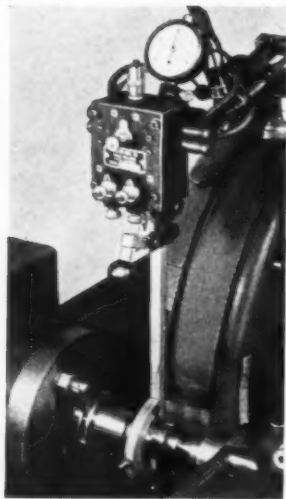
Production of 1500 pieces per hour is possible under ideal conditions. The fast operation is due to the rapid, continuous machine cycle, and is continuous until the machine runs out of stock. A machine cycle is completed in only  $1\frac{1}{2}$  seconds.

The machine is for general duty, and is quickly adjusted to produce cut-off pieces to desired length and diameter. Spindle inserts and collets may be changed in a few minutes; the tool holders permit rapid adjustment for diameter



conditions. Either parting tool bits or rotary cut-off discs may be used. Uncut stock may be manually placed on the feed rolls, or a power driven conveyor with selector may be furnished, supplying feed rolls direct from storage rails. One operator can attend several machines. The Pines Engineering Co., Dept. BB, Aurora, Ill.

## NO. 177 AUTOMATIC GRINDING SIZE CONTROL



Now you can have automatic size and quality control on your cylindrical grinders. Tolerances of .00005 maintained through long and short runs.

Model No. 177 (when grinders are adaptable) will control sizing automatically, eliminating human element.

One operator can run two grinders or one lathe and one grinder. There are many setups possible and practical.

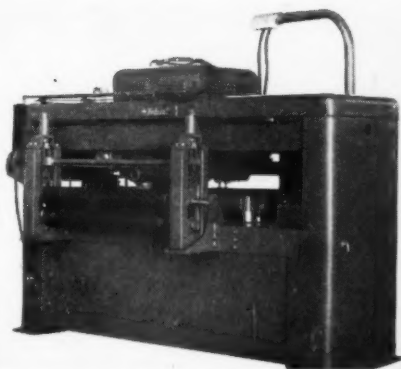
Our engineers will assist you.

**FOSTER ENGINEERING COMPANY**  
4200 WOODWARD AVENUE  
ROYAL OAK, MICHIGAN

## TRAVELING HEAD SEAM WELDER

A new double roll traveling head series seam welder has been developed by the Federal Machine and Welder Co. Especially designed for use in strip mills and in other plants where it is desirable to join strip ends or skelps for long machine runs, the new 125 KVA welder unit makes any strip mill continuous. The machine is supplied in four sizes for welding 38, 48, 56 or 66-inch line, either right or left-handed.

The unit is of fabricated steel construction throughout. A feature is the change-speed gear which gives selective speed range of 10 to 27 feet per minute or 20 to 54 feet per minute. The center clamping bar, located between the weld wheels, locates the strip ends for performing the weld in one easy, semi-automatic operation. The carriage moves on V-type wheels mounted in anti-friction bearings and the carriage drive is totally enclosed within the welder frame. The machine is furnished with one 125 KVA



totally enclosed, air-cooled transformer wound for 220-volt, 60-cycle, single-phase, alternating current power supply and has sixteen steps of heat regulation.

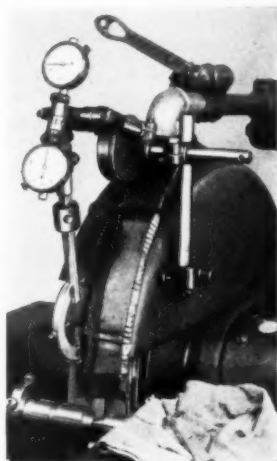
The Federal Machine and Welder Co.,  
Dept. 24, Warren, Ohio.

## VISUAL GRINDING SIZE CONTROL

Well known. Visual reading. Grinding size and quality control on cylindrical grinders. Completely adjustable for all grinders. Thousands in daily use in U.S.A. Many in foreign countries.

Diameter, diameter and length, splines, worms. Over 400 special designs for your problems.

**FOSTER ENGINEERING COMPANY**  
**4200 WOODWARD AVENUE**  
**ROYAL OAK, MICHIGAN**



When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

## MAKE THE HARDEST GRIND THE EASIEST—



With this new process abrasive grinding wheel, tool cutters and cutlery specialists are finding the answer to uniformity on their grinding problems . . . The abrasive power is the same from the first cut to thousandth cut . . .

Prompt delivery of abrasive wheels made to individual order and specification . . .

**WOLF'S NEW PROCESS  
ABRASIVE WHEEL, INC.  
MERIDEN, CONN.**

## ELECTRIC FOOTSWITCH FREES OPERATOR'S HANDS

The Gilman Footswitch is a unit of wide industrial potentialities. It enables the operator to employ both hands at all times when working on drill presses, lathes, grinders and other types of machine tools. It is a dependable, sensitive switch, with silver contacts completely enclosed in molded bakelite. Top and

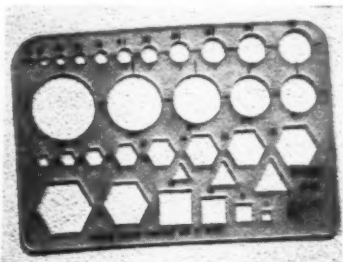


base are heavy cast aluminum, with a non-slip rubber base. Capacity 1250 watts. It handles 10 amperes at 125 volts, or 5 amperes at 250 volts. Model 101, most commonly used, is normally open and turns current on when pedal is depressed. Model 102 is normally closed and turns current off when pedal is depressed.

No installation is necessary on this switch; the user plugs the machine into the switch, and the switch into the electrical outlet. Harrison Manufacturing Co., Dept. BB, 7221 Hocker Ave., Merriam, Kansas.

## PLASTIC DRAFTSMAN'S TEMPLATE

Rapidesign, Inc., presents the new No. 50 Pocket Pal drafting template, designed for draftsmen and engineers. All the most

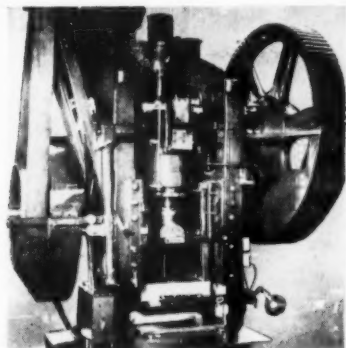


commonly used symbols,—circle, hex, delta and square,—have been incorporated in the new template, which measures 3-5/16" by 5", with rounded corners.

Scaled from 1/16" up to 1". Printing is on negative side to prevent wearing off. Made from .030 mathematical-quality plastic. Template cutouts are precision cut with allowance for pencil point. Rapidesign, Inc., Dept. BB, P.O. Box 592, Glendale, Calif.

#### **PUNCH PRESS HYDRAULIC OVERLOAD JACK**

The Dayton Rogers Manufacturing Co. announces a new hydraulic overload jack, for use on large single and double crank straight side punch presses, and designed to avoid all press overloads,



eliminating possible damage to punch press cranks and frames. It replaces the present connecting rod or strap, including the strap crank pin bearing and adjusting screw of the press. A connecting link is supplied between the crank bearing and ram, with the Hydraulic Overload Jack calibrated at the maximum tonnage of the press, giving the press operator and work piece protection.

A dribble pump, actuated from a cam on the throw of the press, maintains a constant preloaded pressure on the hydraulic jack cylinder, assuring constant predetermined pressure at the point of operation. If the press is overloaded beyond the predetermined pressure, the entire jack mechanism telescopes, allowing the press to continue throughout the work cycle of the press crank. Setting is obtained by either power or manually operated pump to the desired working pressure.

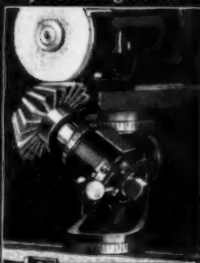
Available in sizes from 50 to 500 tons. Dayton Rogers Manufacturing Co., Dept. BB, 2849 12th Ave., So., Minneapolis 7, Minn.

## **CLEVELAND INDEXING HEAD**

Regrind all straight or taper shank tools from 1/8" to 1 1/2" diameter in your own shop... on any surface grinder.

Rotates 360° in three planes on a common center.

Automatic Indexing Gear for re-establishing concentricity.



Write for Catalog 464... Today

**G** RINDERS & FIXTURES, Inc.  
1249 W. 4th ST. - CLEVELAND 13, OHIO

#### **AXIAL FACE MILL FOR CAST IRON**

Kennametal Inc., has introduced its "Axial Face Kennamill" designed for the production milling of cast iron, and also suitable for light to medium cuts on solid or cored castings. The new mill is claimed to incorporate the advantages of solid blade face mills with maximum number of blades.

The set up is easy, since the blades can be assembled to within a few thousandths on the face and periphery, and will not move during tightening. The cutter life between grinds is long, the manufacturers claim, due to the rigid solid blade construction. Sharpening is simplified because of the open construction of the cutter, freedom from brazing strains, and the fact that there are only three surfaces to grind.

The cutter can be mounted on all common spindles with a bolt circle provided to order. The body is shaped to permit grinding a 45° corner angle for milling light cored sections, and is sufficiently over nominal diameter to cut full width when so ground. Five sizes are now available: 6", 8", 10", 12", and 14". Further data will be supplied by Kennametal Inc., Dept. BB, Latrobe, Pa.

## ARTUS ARBOR SPACERS

The **COLOR** tells  
the **THICKNESS**

ARTUS Arbor Spacers made of plastic in various colors identify thickness at a glance! .001, .0015, .002, .003, .005, .0075, .010-.030. Speed up accurate fitting at low cost. Write for folder.



### CONVENIENT TRIAL OFFER Handy Spacer Assortment

10 ea.	.001 — .0125 thick
5 ea.	.015 — .030 thick

<b>100 SPACERS IN ALL</b>	
7/8" — \$3.10	1 1/4" — \$3.80
1" — 3.35	1 1/2" — 4.70

Other standard sizes also available.

## ARTUS PLASTIC SHIM



### AND FEELER GAUGE STOCK

The **COLOR**  
tells the  
**THICKNESS**

• Each thickness a distinctive, easy to identify color. Impervious to oil. Long lasting 5"x20" sheets. Special sizes to order. Handy assortment, shim stock, 12 colors—12 thicknesses (.001-.030). Bound together..... **\$4.25**

• **Illustrated Folder Free.**

Immediate Delivery on Spacers, Gaskets, Shims, Large Slitting Saw Spacers.

A few territories open for active distributors

**INDUSTRIAL PRODUCTS SUPPLIERS**  
106 Water St., Dept. H, New York 5, N. Y.

**INDUSTRIAL PRODUCTS SUPPLIERS**  
106 Water St., Dept. H, New York 5, N. Y.

Gentlemen:

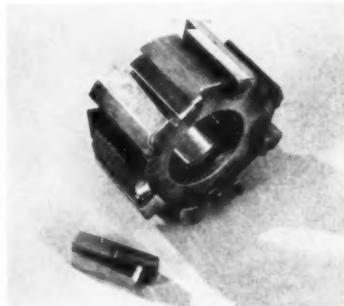
Please send me:

- ☐ Handy Spacer Asst.  
☐ Handy Shim Stock Asst.  
☐ Free Illustrated Literature

NAME .....  
COMPANY .....  
STREET .....  
CITY ..... STATE.....

## INSERTED-BLADE CARBOLOY CUTTERS REMAIN RIGID

An advanced design in multiple operation Carboly Cemented Carbide Cutters has been developed by the Johnson Tool Co. According to the manufacturers, the use of the new type inserted-blade cutters, the five advantages will be provided:



1. No loosening or displacement of the blades, since they are self-locking; once adjusted to the desired position, they remain in place. The heavier the tool load, the more securely the blades are claimed to anchor themselves, permitting extremely close cutting tolerances.

2. The blades are easy to remove and reset, because of their simple construction, consisting of just two parts; no set screws are needed.

3. The Inserted-Blade Cutter takes the strain off serrations and applies it instead against flat, plane surfaces, assuring longer life, as well as close holding to minute tolerances.

4. Since the tools are held securely, tool life of the cutters is increased, and the number of set-ups per job is reduced.

5. Grinding time is reduced, since the blades move out on the face and the diameter uniformly; faster set-up for re-grinding is assured due to the simple construction of the unit.

Complete technical data and specifications on the Johnson-Type Inserted-Blade Cutters are available upon request to the Johnson Tool Co., Dept. BB, 13001 Plymouth Road, Detroit 27, Mich.

## NEW H-F CONVERTER HAS 20 KILOWATT RATING

A new 20-Kw. Ajax-Northrup high frequency converter for induction heating and melting is announced by the Ajax Electrothermic Corp. The new converter encloses all parts into one compact, semi-portable unit, measuring 44"x44"x58".



One control knob adjusts the converter to the proper power output when connected to an Ajax-Northrup metallurgical furnace, as in the photograph, or to a heating coil. The electrical circuit of the converter is self-tuning, with frequencies varying from 20,000 to 80,000 cycles per second, depending upon the furnace coil employed. The front of the housing also mounts a watt meter and starting push button.

The new unit has copper electrodes in the hydrogen-atmosphere, water-cooled spark gap chamber. To safeguard against damage to capacitor, spark gap, or furnace coils, an interlocked alarm bell rings, if the converter is turned on when the cooling water is not flowing properly.

The new 20-Kw converter is claimed to have a wide field of application in laboratory and commercial heating and melting. It melts steel up to 30 lbs quantity; brass and bronze alloys in melts up to 60 lbs, and is useful for melting precious metals. The heating applications of the unit include such jobs as brazing, hardening, soldering.

The Ajax-Northrup converter is capable of sustained operation at its 20-Kw rating; under favorable conditions, more power can be drawn. The power supply to the converter is single phase, A.C., 208, 220, or 440 volts. The Ajax Electrothermic Corp., Dept. BB, Ajax Park, Trenton 5, N. J.

## Grinding

## Grinding

## Grinding

## Grinding

**SAVE 40%**

### DIAMOND WHEELS

4x1/2x1 1/4—D 120-100-1/8 Resin .....	\$23.50 ea.
7x1/2x1 1/4—D 180-50-1/8 Resin .....	26.50 ea.
8x1/2x1 1/4—D 100-100-1/16 Resin ...	74.00 ea.
4x1/4x1 1/4—D 120-100-1/8 Metal or Vitrified .....	44.00 ea.
6x3/4 Face x 1 1/4" Hole Ex-Cell-O Type Cup Wheel D 180-50-1/8 Resin or D 120 or 220-100-1/16 Metal .....	\$79.00 ea.

### GREEN GRIT SILICON CARBIDE

#### 60 or 120 grit F-J Hardness

14x4x11 Plate Mounted Gamuter Type .....	\$11.50 ea.
10x2x7 Plate Mounted Gamuter Type .....	6.50 ea.
14x2x1 1/4 Straight Wheels .....	7.00 ea.
12x2x1 1/4 Straight Wheels .....	6.00 ea.
10x1 1/2x2 Straight Wheels .....	4.50 ea.
7x1/2x1 1/4 Straight Wheels .....	1.70 ea.

### HEAVY SNAGGING WHEELS

24x2 1/2x12 High Speed Resinoid A14Q .....	\$25.00 ea.
12x1x1 1/4 High Speed Resinoid A24Q .....	4.50 ea.
6/4-3/4x2 3/8" Flaring Cups A16Q .....	2.35 ea.

### CENTERLESS • CYLINDRICAL

20x5x12 grade 60L thru 0 .....	\$20.00 ea.
20x4x12 grade 60L thru 0 .....	18.00 ea.
20x1 1/2 thru 3x12 grade 60L thru 0	12.00 ea.
14" or 12"x1"x5" grade 60L thru 0	4.50 ea.

### MISCELLANEOUS

Abrasive Cloth Rolls—36, 60, 80, 100, 120, 150, 240, 320, 400x1 1/2 or 2" wide .....	\$1.75 ea.
Special—Special 3x3/8x1/4 or 6x3/8x 1 1/4 46J .....	.40 ea.
Mounted Points—1/8 or 1/4" Shanks .....	.23 ea.
Abrasive Cutoff Wheels 12, 14, 16 or 18"x1/8"x1 .....	1.35 ea.
Tool Room Wheels — Type 1, Type 6 or Type 11 4"-6" Diam. x 1 1/4" Hole .....	.90 ea.
MX Wheels—Mtd. Points or Straight Wheels .....	.35 ea.

All above as well as hundreds of other sizes available for immediate shipment from stock.

## THE ABRASIVE

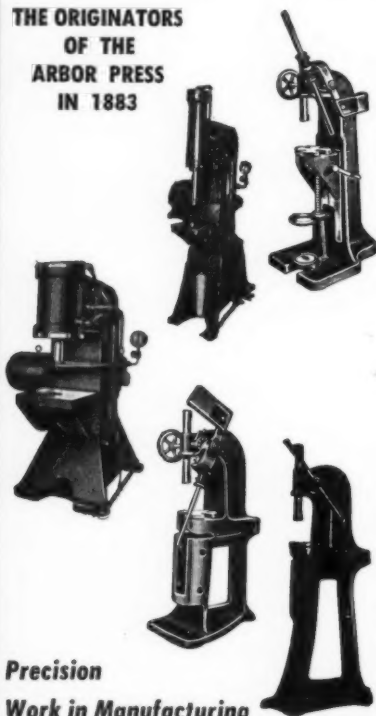
## SPECIALTIES DIVISION

**The Metal Removal Co.**

1645 No. Wells St. Chicago, Ill.  
PHONE: HUMBoldt 5944

**FOR ASSEMBLY, BENDING  
★ AND BROACHING ★  
1883 - GREENERD - 1947**

**THE ORIGINATORS  
OF THE  
ARBOR PRESS  
IN 1883**



**Precision  
Work in Manufacturing**

An Arbor Press for every need, ranging from 1/4 to 30 tons capacity, both hydraulic and mechanical types. Write for Catalog G.

**GREENERD ARBOR PRESSES**  
NASHUA, NEW HAMPSHIRE, U.S.A.  
EST. 1883

**COMPANION CLEANERS FOR  
INDUSTRIAL MAINTENANCE**

The new Breuer Tornado Floor Machine is a powerful motor-driven floor brush capable of scrubbing, polishing, waxing, sanding, steel-wooling, and shampooing floors. It can be used on any type of floor or floor covering with an interchange of suitable brushes and may be equipped with a solution tank which feeds directly into the base of the bristles. Five models are in production, ranging from 1/4 hp. to 1 hp. with operating brush spreads from 12" to 20". Gears are enclosed in cast aluminum housings. The models are equipped with splash proof, continuous load motors. Each model is quiet and easily handled, well balanced, and with the correct weight and pressure to clean thoroughly and effectively.

When used with the Tornado Industrial Vacuum Cleaner, this combination does a quick and satisfactory job of floor maintenance. The Tornado Vacuum Cleaner has a powerful suction with a 49" water lift which picks up surplus water and all moist scraps, deposits them in the 12 gal. tank and dries the floor so thoroughly that it can be used in perfect safety without danger of slipping. The Vacuum Cleaner usually follows the



Floor Machine in one continuous operation for quicker cleaning. These cleaners can be used with a detergent on oily

or crust covered floors with satisfactory results, to eliminate employee hazards and dangers.

Combination floor machine-vacuum cleaning reduces time and labor for maintenance, and provides a clean, safe floor for employees, improving production and morale. Further data supplied by the Breuer Electric Manufacturing Co., Dept. BB, 5100 No. Ravenswood Ave., Chicago 40, Ill.

### SOLID CARBIDE CENTER-LAPPING TOOL

Another development in carbide tools is announced by Raymac Mfg. Company, Inc., 3729 Cass Avenue, Detroit. In production are solid carbide center-lapping tools in standard sizes,  $\frac{1}{2} \times 1\frac{1}{2}$ " and  $\frac{3}{8} \times 1\frac{1}{2}$ " — 60°, included angle. Special sizes are also manufactured as required.

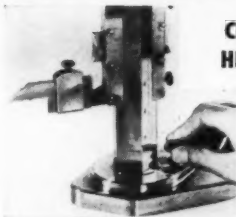
Raymac points out that the new solid carbide center-lapping tool is designed to replace abrasives, and that it expedites production since it eliminates costly man-hours lost in dressing.

Users of the tool have reported that it can be reconditioned from 25 to 60 times with no change in quality of operation. The tool can be used in standard center-lapping machines or drill presses in working metal up to 62-65 C scale Rockwell hardness.



The solid carbide center-lapping tool is an addition to Raymac's all-carbide line of miniature grinding wheels, small reamers, and standard and midjet burrs. All the tools are precision ground by hand and not machine indexed.

## SCHERR aids to precision — production



### CHESTERMAN HEIGHT GAGE

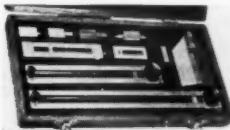
A big sturdy stabilized instrument. Fine adjustment by screw operated from knurled nut on base eliminates all chance of rocking instrument while measuring.

Finger pressure on two lugs for rapid up or down adjustment of the head.  $2\frac{1}{2}$ " long vernier in place of the normal  $\frac{1}{2}$ " vernier provides greater visibility without magnifier or removing gage from work. Both English and metric readings. Made in sizes from 12" to 48"—capacities sufficient for the most unusual measurements.

### ULTRA-CHEX GAGE BLOCKS

The last word in modern basic accuracy brought within the grasp of all shops large and small. Sets in size for all budgets.

All blocks accurate to five millionths. Illustrated is the 34-block set, giving 80,000 combinations in steps of  $1/10,000$ ", with optical flat for checking wear. Low prices allow for constant practical shop use in setting tools, checking gages, locating holes in jigs and fixtures, etc. Many shops use a number of sets, with one master set for reference.



### GAGE BLOCK UTILITY SET

Quick adjustable holders. Greatly expands the usefulness of any set of standard gage blocks. The set includes four holders

—2", 4", 8" and 12", two jaws each for inside and outside measurements, a 60 deg. center point, a scriber point and a substantial height gage base. Holders have no long projecting screws to make handling awkward. Every shop can profitably use one or more of these sets, which will save their cost many times over by applying gage block accuracy at first hand, allowing for no variation through the use of any other tool. Any parts of this set furnished separately at moderate cost.

Write for full details on these tools, and for the Scherr Small Tool Catalog.

## GEO. SCHERR CO., Inc.

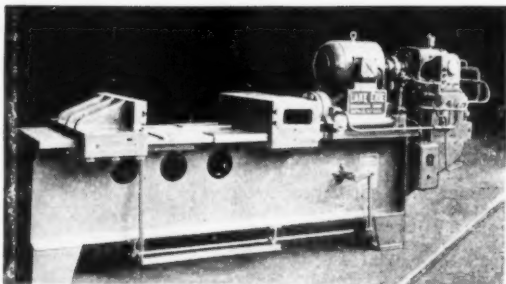
193 - Lafayette St. New York 12, N.Y.

## LAKE ERIE HYDAULIC BULLDOZERS

Lake Erie hydraulic bulldozers are available in a wide range of types and sizes for both standard and special applications. They are designed and built as compact, self-contained units that can be placed in operation or moved to new locations when necessary with a minimum of delay and expense.

The bulldozers are foot treadle operated. Pressure on the treadle advances the crosshead. The stroke can be stopped and returned at any point by releasing the treadle. Auxiliary and double acting traverse cylinders give rapid approach and return of the crosshead. Any part of the stroke can be used with full pressure at any point. The hydraulic system employed eliminates danger of breakage through overloading.

Frames for the bulldozers are constructed of heavy welded sections. De-



flection under full load is negligible and close die alignment is assured at all times. Ways are hardened steel highly resistant to wear. Standard equipment includes adjustable stroke stops, automatic adjustable pressure control on pumps, air and oil filters, and pressure gages. Data on models for specific needs available through Lake Erie Engineering Corp., Dept. BB, Buffalo 17, N. Y.

## BRAND NEW PRECISION

# ROTARY TABLES



9"	\$ 97.00	
12"	160.00	
15"	185.00	
18"	220.00	
18"	350.00	Extra Heavy Duty
21"	500.00	Extra Heavy Duty
25"	590.00	Extra Heavy Duty

OUR ROTARY TABLE WILL TAKE THE PLACE OF A COSTLY FIXTURE. IT IS USED FOR ALL KINDS OF WORK ON MILLING MACHINES, SHAPERS, DRILL PRESSES AND HORIZONTAL BORING MILLS.

**WE CAN ALSO FURNISH DIVIDING ATTACHMENTS.**

SEND FOR LITERATURE AND DETAILS.

**IMMEDIATE DELIVERY**

**SEND FOR 220 PAGE FREE CATALOG**

**LAFAYETTE TOOL & SUPPLY CO.**

128 LAFAYETTE STREET

NEW YORK 13, N. Y.

### SMALL CONSTANT FEED GEAR PUMP

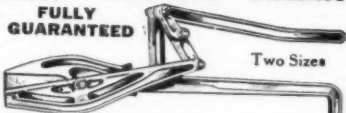
This constant feed gear pump is a small capacity unit, providing 50 cc's per minute at 100 rpm. Because of this small delivery the correct quantity required by the machine can be fed to it without by-passing a high percentage of the output. The pump is claimed to maintain a constant feed under high pressure during operation of the machine.



Three types are available: the universal gear pump (upper right) can be mounted in any position, the direction of drive shaft rotation determining the direction of flow. The reversible gear pump (left center) maintains flow in one direction only, regardless of change of drive shaft rotation during operation. The sump type gear pump (lower right) is equipped with an integral fine mesh screen and may be mounted directly in the sump.

The unit is readily adaptable to machines where space limitations exist. For further data, write to the Bijur Lubricating Corp., Dept. BB, Long Island City 1, N. Y.

### ALL ALLOY PORTABLE SHEARS FULLY GUARANTEED



Two Sizes

No. 1 cuts up to No. 11 gauge strip or sheet.

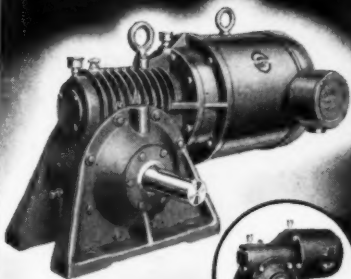
No. 2 cuts up to 1/4" steel plate.

**BREMIL MFG. CO.**

1720 Pittsburgh Ave.

Erie, Pa.

## Janette SPEED REDUCERS



1/30 to 7 1/2 H.P.  
.08 to 447 R.P.M.

### For SLOW Speed DRIVES

JANETTE is one of the few Speed Reducer Manufacturers who build their own Gears, Gear Boxes and Motors especially designed for use with Speed Reducers.

During the 37 Years that Janette Geared Electrical Machinery has been manufactured, skimping has never been permitted in any of their products. This policy has resulted in establishing for Janette a world wide reputation as a manufacturer of the highest quality machinery.

**Where DEPENDABILITY is a MUST, you can safely specify JANETTE Speed Reducers.**

**Janette Manufacturing Company**  
556 W. Monroe St. Chicago 6, Ill.

## THE SPINDRIVER—A FIVE-IN-ONE TOOL

The Spindriver works faster and easier than an ordinary screwdriver, and does four other jobs besides. It was designed on the work habits of mechanics and other tool users. The only addition has been the non-slip handle of Lumarith (cellulose acetate), supplied by Hopp Press, Inc. of New York, in  $\frac{3}{4}$ " extruded amber rod.



Mechanics have tried to speed up the winding in or out of free-turning machine screws with the conventional screwdriver by twirling its shank with the free left hand. With the Spindriver, the palm of the hand rests on the Spinbearing, and the shank is revolved clockwise, leaving the other hand free for holding and adjusting. Impetus is given to the spin by the crossbar on the shank which acts as a flywheel. The inertia of the crossbar flywheel increases the number of revolutions of the screwdriver and cuts down "winding" time. The cross bar was converted into a torque bar which can be gripped by hand for turning power, eliminating the necessity for a wrench or pliers.

The crossbar was formed into two balanced hammer heads; the addition of a thumb screw enabled the Spinhammer to be slid down to the tip of the screw-

driver and tightened, to create a balanced, efficient hammer, which also serves as a prying fulcrum for the Spindriver. The hammer heads were made flat so that either end is a suitable anvil for small jobs such as straightening keys, knife points, etc.

The Spindriver is manufactured by the Skamser Spindriver Co. Los Angeles, Calif., and is available at most hardware and appliance stores.

## NEW OFFSET HOLDER ADDED TO EJECTOR LINE

As an addition to its Ejector Type straight tool holders, the Super Tool Co. announces a complete line of offset Ejector Tool Holders. This new tool offers all the advantages in economy of the straight Ejector Tools, plus the ability to do hard to reach facing and boring operations.

These tools have filled a demand for a tool holder that would hold an insert of solid carbide without clamping strains and would allow the chips freedom from interference with the clamping mechanism.



Due to the compound angles at which this solid carbide insert is held in the holder, the maximum economy in regrinds is achieved without the wheel ever coming in contact with the steel holder.

Literature is available on request to the Super Tool Co., Dept. BB, 21650 Hoover Road, Detroit 13, Mich.

### "STEELSET" DIAMOND DRESSING TOOLS

Simultaneous action of a large number of cutting points by the use of area-type dressers, impregnated with small, low-cost industrial diamonds set in a special sintered-steel matrix tends toward faster cutting or truing, plus longer life. This, in turn, results in lower costs per dressing.

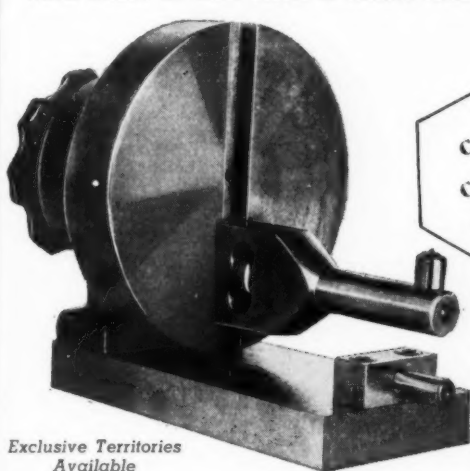
The Fish-Schurman Corp. announces their new "Steelset" Area-Type Dressing and Truing Tools for economical dressing. There is only an infinitesimal loss if one of the many small stones is damaged or pulled out of the mat-

rix, since many others are around or behind it to take its place. The "Steelset" unit may be used to completion without turning or resetting, for either dry or wet operation. By selecting the proper grit sizes and procedure, both the truing and dressing of work may be carried out simultaneously in a fraction of the time consumed by other methods, according to the manufacturer.

Complete technical data on these units is available by writing for bulletin No. DT-323, to the Fish-Schurman Corp., Dept. BB, 230 E. 45th St., New York 17, N. Y.

## RADIUS EMERY WHEEL DRESSER for PRECISION PERFORMANCE

A time-saving device designed to meet the demand for an inexpensive Radii Wheel Dresser for either convex or concave radius dressing.



Exclusive Territories  
Available



IMMEDIATE DELIVERY

**\$72.00**

F.O.B. New York

Write for Literature

## MONTGOMERY & CO.

Machine Tool Accessories Division

53 Park Place

New York 7, N. Y.

THE NEW

# Star

The New  
Improved  
Elliott  
Flexible  
Shaft Machine



## Flexible Shaft Machines

and Attachments. Complete Flexible Shaft Machines . . . unit drives; ball-bearing handpieces; motor couplings; sanding drums; angle heads; arbors, etc.

### Assemblies

We can furnish flexible shaft assemblies in all sizes and any design, with rubber, metal or plastic casings; to improve the appearance and wearing qualities.

ENGINEERING AND  
DESIGN SERVICE



**ELLIOTT**  
MANUFACTURING COMPANY

202 Prospect Ave. Binghamton, N. Y.

### ADJUSTABLE BORING TOOL REDUCES SET-UP TIME

The Adjustable Boring Tool is for use on hand and automatic screw machines, high speed milling heads, and automatic boring machines. It is a compact, rugged, easily adjusted, positive locking unit, and is claimed to save tooling costs and set-up time. All parts are hardened for wear.



The accessory bores holes up to  $1\frac{1}{2}$ " dia., has a body  $1\frac{3}{8}$ " dia. by  $2\frac{5}{8}$ " long, and accepts a  $\frac{3}{8}$ " dia. boring bar. Available with either  $\frac{1}{2}$ " dia. by  $1\frac{1}{8}$ " long, or 1" dia. by  $2\frac{3}{4}$ " long straight shank. The tool is furnished complete with one high speed steel boring bar and one adjusting key. Pump & Products Co., Dept. BB, 6715 Detroit Ave., Cleveland 2, Ohio.

### METAL HANDLES FOR THREAD GAGES

Light weight, flexible all-metal handles for small diameter thread gages are a new feature announced by Lincoln Park Industries, Dept. BB, 1719 Ferris Ave., Lincoln Park 25, Mich. These handles, originally developed for carbide wire type plug gages, provide flexibility which reduces pressure on the gage member and minimizes hazard of breakage due to



accident or rough handling. They are of collet type and are made of metal throughout, assuring strength and durability. They are not affected by oils. Flexible handles can be supplied in place of solid handles on Lincoln Park thread gages up to No. 10 machine screw size.

# Adjustable MULTI-DRILL

for Production Drilling

## 9" DRILLING AREA

AVAILABLE WITH 2 TO 8 SPINDLES

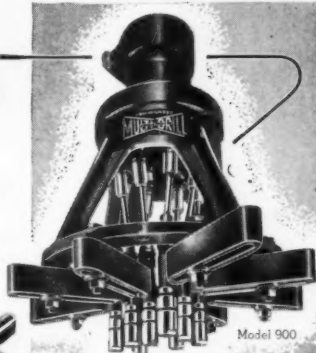
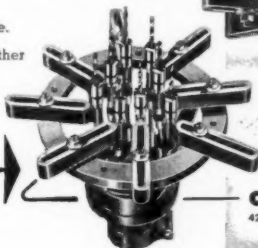
- Designed for accurate, high speed production drilling
- RUGGED CONSTRUCTION
- Quick, easy adjustments to **any** hole pattern on or within a 9" circle;  $\frac{1}{2}$ " minimum center distances; Drill sizes  $\frac{1}{16}$ " to  $\frac{3}{4}$ "
- Special adaptations available.

MULTI-DRILLS are made in other sizes and models.

Write for details and name of your nearest Distributor.

• **Locator arms are designed for fast, easy adjustment**

Dependable Performance...  
proven by industry



**FITS ANY  
DRILL PRESS**

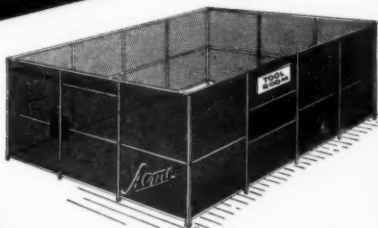
**COMMANDER MFG. CO.**

4227 W. KINZIE STREET, CHICAGO 24, ILLINOIS

**LEADERS FOR HALF A CENTURY**

## TOOL CRIBS and PARTITIONS

**Standard Sections Woven Wire Mesh Panels and Doors to enclose Tool Cribbs, Stock rooms and other enclosures.**



**IMMEDIATE DELIVERY**

*Write for Catalog*



**WIRE & IRON WORKS**

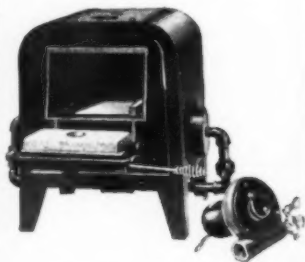
3519 E. CANFIELD

— DETROIT 7, MICH.

# Quick Acting JOHNSON FURNACES

## JOHNSON Hi-Speed No. 120 Bench Furnace

- 1500° F. IN 5 MINUTES  
2300° F. IN 30 MINUTES
- HARDENS ANY STEELS
- BRAZES CARBIDE TIPPED TOOLS



Designed primarily for heat treating high speed steels, this wide-range Quick Acting Johnson Furnace is equally efficient for hardening high carbon steels, tools, dies and small metal parts. Easily regulated with accuracy. Heats up FAST to save time and gas. Firebox 5x7 $\frac{3}{4}$ x13 $\frac{1}{2}$ . Complete with Carbofrax Hearth, G.E. Motor, and Johnson Blower.

**\$120.50**

F.O.B. Factory

**ORDER  
TODAY!**

**SEND FOR FREE CATALOG**

**JOHNSON GAS APPLIANCE CO.**

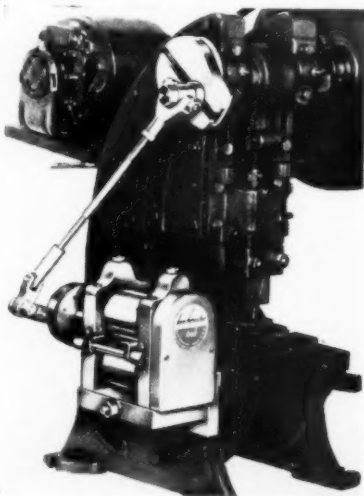
570 E Ave. N. W., Cedar Rapids, Iowa

## PRESS FRICTION ROLL FEED

An automatic friction roll feed for presses presents many new and exclusive features, according to the manufacturer, Benchmaster Manufacturing Co., 2952 West Pico Blvd., Los Angeles 6, Calif.

It is designed for both old and new types of Benchmaster punch presses, as well as for most standard punch presses. The accessory may be used with metal, wood, plastic, cardboard and felt. It has been tested by the manufacturer in long runs, and its operation has proved excellent.

Construction features include: friction drive geared down to give 0 to 3" adjustment in feed; will take stock up to 3" in width; adjustment for different thicknesses of stock, from 0 to 3/16" in thousandths, is taken up by a spring-loaded housing; height adjustment, 0 to 2-1/4"; machine can be operated at full speed of 285 per minute; rollers can be reversed from forward to backward in a few seconds; unique adjustable brake;



simple 2-bolt installation permits rapid changing from front to side of press; rollers (2-1/4" in diameter) and friction roll are hardened and ground; bronze bearings protect all wear points. Further information may be obtained by writing the manufacturer.

## BARBER-COLMAN NEW HOBBIING MACHINE

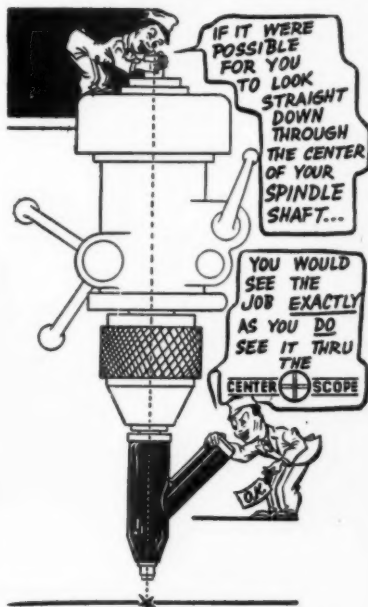
The new Barber-Colman No. 8-12 Production Hobbing Machine features semi-automatic cycling, speed for carbide hobbing, conventional and climb hobbing in either direction, rapid traverse in either direction, and over-all design to facilitate easy operating, servicing and maintenance. It is constructed in unit assemblies, with hardened and ground Vee and flat ways on the horizontal bed and a one-piece overarm, index worm gear case and work slide. For the ordinary run of job, operation is semi-automatic; after the initial set-up is made, the operator merely loads and unloads the work and pushes the cycle lever.



For high production runs on appropriate parts, the machine is designed to accommodate magazine loading, so that the operation is completely automatic.

The No. 8-12 Machine handles work up to 8" in diameter on some pitches and has a hob slide travel of 12". The maximum tooth form which can be hobbled under optimum conditions is 10 diametral pitch. Maximum hob diameter which can be used is 2 1/4". Standard machines will have spindle speeds from 150 to 1350 rpm, and the feeds per revolution of work range from .005" to .400". The rigidity and strength of the moving members of the machine will permit greater accuracy, faster machining speeds and heavier cuts than have been possible within its range or work. Additional data is available from Barber-Colman Co., Dept. BB, Rockford, Ill.

## ONLY WITH THE Center Scope can you get . . . UNQUESTIONED ACCURACY



**ONLY WITH CENTER SCOPE**  
Can you get unquestioned accuracy in locating lay-out centers on your milling machines, jig borers, lathes, drill presses and other special machine tools.

**CENTER SCOPES ARE ACCURATE**  
Plus or minus one ten thousandth.

**CENTER SCOPES ARE FAST**  
Line-up your layout in 30 seconds.

**CENTER SCOPES ARE SIMPLE**  
ANYONE can use them.

**INSIST ON THE GENUINE CENTER SCOPE**

Write for Catalogue No. 8

**CENTER SCOPE PRODUCTS**  
3829 San Fernando Road  
Glendale 4, California



## THE ELLIS DIVIDING HEAD

Many unique features make the ELLIS Dividing Head more than an ordinary indexing fixture. It is a precise, rugged unit with 6½" normal swing increased to 11" swing through the use of riser blocks. It TILTS more than 100 degrees in the vertical plane—SWIVELS 360 degrees in the horizontal plane—INDEXES by crank, or directly by hand. Work is held between centers, or in chucks or collets. The ELLIS Dividing Head is a universal work head that will increase the production versatility of your milling machines, grinders, drill presses and jig borers—write for complete details today.



**NICHOLS-MORRIS  
CORPORATION**

42-A CHURCH STREET,  
NEW YORK 7, N.Y.

### RUTHMAN PUMPMOTOR EQUIPPED WITH DUAL INLETS

A recently developed model Gusher Coolant Pump incorporating several new features is about to be placed on the market by the Ruthman Machinery Co. Designated as the Pumpmotor, the new unit is a totally enclosed type, equipped with a new style upper end bell provided with a large built-in conduit box with sufficient capacity to accommodate the multiple lead wires of dual voltage



stators. The through bolts fasten from inside the upper end bell, adding to the streamlined appearance, and improving the unit's drip-proof construction. Large precision sealed pre-lubricated ball bearings are used, eliminating the need for grease fittings.

Twin inlets inside the pump are arranged to provide hydro-dynamic balance, eliminating possible end thrust on the shaft. All rotating parts are dynamically balanced by an electronic process, insuring quiet operation and extended life. The pump is claimed to be able to handle liquids containing reasonable amounts of grit and abrasives, since there is no metal to metal contact within the submerged portion of the unit.

The capacity of the Pumpmotor, at 26' head is 40 GPM with a ½ HP motor, and 60 GPM with a ¾ HP motor. Complete information is available from the Ruthman Machinery Co., Dept. BB, 1809 Reading Road, Cincinnati 2, Ohio.

**MILLING**

**BURKE**

**MACHINES**



**FOR SMALL, DIFFICULT WORK ON  
A PRODUCTION BASIS . . .**

**GENERAL SPECIFICATIONS**

Mach. No.	Working Surface of Table	Longitudinal Feed	Traverse Feed	Vertical Feed	Maximum Distance between center of spindle and table
1	3½x12	8	3¾	4½	5½
2	3¾x16	6	2	4½	5
3	3½x12	8	3¾	7½	7½
4	3¾x16	8	3	8	8

Above: No. 4 Motor Driven  
Milling Machine. Nos. 1,  
2, 3, and 4 are specially  
suited for handling small,  
difficult work on a produc-  
tion basis.

Write **TODAY** for complete information, specifications,  
attachments not shown in above table.

**BURKE MACHINE TOOL CO.**  
**510 Sandusky St.      Conneaut, Ohio**

**DRILL JIG BUSHINGS**

**Accurate**  
**Interchangeable**  
**Concentric**

**Acme Industrial Company**  
210 N. LAFLIN ST.  
CHICAGO 7, ILLINOIS

**WRITE FOR FREE CATALOG!**

## FOR *Faster* PRECISION FITTING



of Gears, valves, cylinders, bushings, bearings, etc.

*Timesaver Lapping Compound* is a powdered abrasive prepared especially for applications where fine lapping, perfect control and freedom from embedment (charging) are imperative.

Check these features:

- Absolutely non-imbedding
- Diminishing (self reducing) action
- Becomes totally inert thru use
- Laps all metals from soft babbitt to hardened steel
- 28 years of successful use

Write for samples and literature

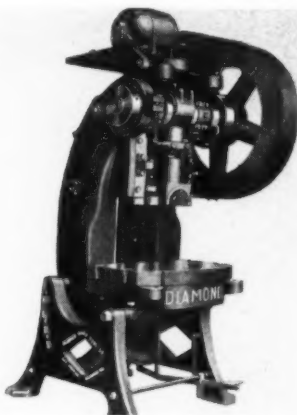
**TIMESAVER PRODUCTS CO.**

139 W. Monroe St.

Chicago 5, Ill.

## DIAMOND 55 AND 56 TON PUNCH PRESSES

Diamond Machine Tool Co. announces its latest punch press designed to strain gauge analysis. The new plain type press is made in 55 and 56 ton capacities. The frames of both units are of open-back construction, the sections being designed to provide increased strength at the points of maximum stress, as indicated by the strain gauge analyzer. All bearing and sliding surfaces are micro-finished, adding to longevity and more accurate operation. The clutch employs three sets of driving dogs engaging the fly-wheel at any 120° angle of rotation. The clutch dogs are oversize, being fully supported within the clutch housing. This additional support eliminates practically all bending stress, placing the dog almost entirely in shear, resulting in the virtual elimination of fatigue



failures at this point, according to the manufacturers.

The unit delivers a maximum of 100 strokes per minute; the standard stroke is 3". The press bed area is 20" x 30", with a bed opening of 12 $\frac{3}{4}$ " x 16 $\frac{1}{2}$ ". The strain gauge analysis employed in the design has disclosed the fact that with no increase in the weight of the main casting, frame strengths as high as 5 times the rated capacity have been obtained. A full report of the Diamond Strain Gauge Tests on punch presses will be sent in answer to all requests. Write to the Diamond Machine Tool Co., Dept. BB, Los Angeles, Calif.

MODEL  
175  
HYDRAULIC  
MARKING  
MACHINE



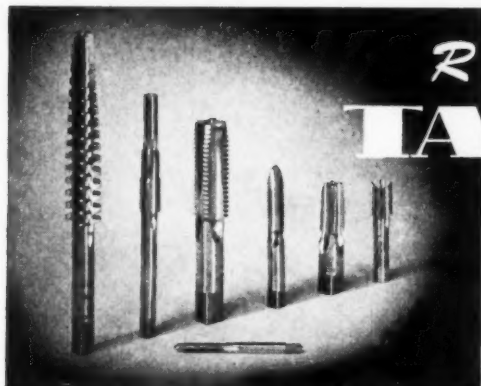
## MARK IT for MARKET

Modern Marking Machines now enable most manufacturers of metal components to identify their products at trifling costs. TRADE MARKS — MANUFACTURER — PART NUMBERS PERMANENTLY ROLLED ON YOUR PRODUCTS will help you market them.

Send prints of parts, showing required marking and its location on part with hourly production for free recommendation.

*Write for Catalog*

**GEO. T. SCHMIDT, INC.**  
1802 W. Belle Plaine Ave.  
Chicago • 13 • Illinois



## R & N TAPS

Many of the country's largest and most exacting Tap users rely on R & N to maintain peak production.

Dependable performance is not a difficult assignment when R & N HSS Ground from the solid Taps are on the job.

Our new 109 page, No. 8 Catalog is ready for mailing. A request on your letterhead brings it.

**Next time try R & N Taps.**

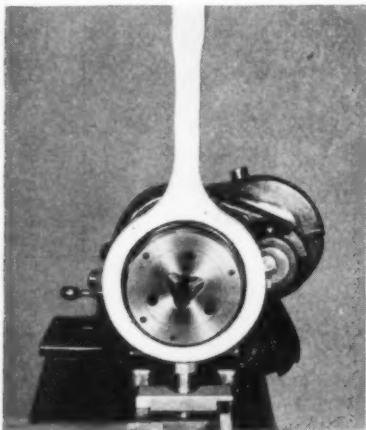
**REIFF & NESTOR COMPANY**

manufacturers of TAPS AND REAMERS  
**LYKENS, PA.**

## FRY SPEED CHUCK COMBINES FEATURES OF COLLET AND JAW CHUCK

Airo Products Co. announces the new Model No. 3E1 Fry Multi-Duty Speed Chuck which combines the advantages of both the Collet and Jaw Chuck. The Fry Speed Chuck is designed to eliminate expensive collet chuck equipment. It is quickly adjustable to concentric or eccentric work.

The unit is equipped with a positive, tool steel jaw, and position lock, with guaranteed repeat performance. The chuck may be opened or closed in motion



at high speed, in either direction. The speed chuck holds round, square or hexagon stock. The capacity is  $\frac{1}{8}$ " to 1" round,  $\frac{7}{16}$ " hexagon, and  $\frac{3}{4}$ " square. It is adaptable to either engine or turret lathe.

Direct inquiries to Mr. Hugh A. Fry, Airo Products Co., Dept. BB, 2938 Denby Ave., Los Angeles 26, Calif.

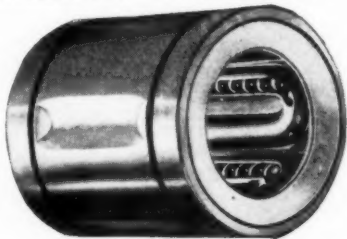
## LINEAR BALL BEARINGS OFFER DESIGN ECONOMIES

Thomson Industries, Inc., announces the development of a new type unlimited travel anti-friction ball bearing for linear or reciprocating motion which offers the engineer and designer advantages and economies comparable with those obtained with ball bearings in rotary motions.

The new bearing, called "Series A" Ball Bushing is a complete self contained

unit of only three basic parts in addition to the balls; a sleeve made of 52100 ball bearing steel, hardened and ground to close tolerances; a pressed steel retainer fabricated in long continuous strips, cut off and rolled up to fit inside the sleeve; a pair of rings pressed in the ends of the sleeve to position and secure the retainer to the sleeve.

"Series A" Ball Bushings are available for shafts of  $\frac{1}{4}$ ",  $\frac{1}{2}$ ",  $\frac{3}{4}$ " and 1" diameter. Engineering data on the sizes now being produced is available upon request.



The new bearing has a low friction coefficient which prevents cocking and binding and its free rolling action maintains precision alignment by elimination of wear. Troublesome lubrication problems of plain sliding members are eliminated as Ball Bushings do not depend on the maintenance of an oil film over an exposed surface.

Besides reducing the cost of many mechanisms and machines, Ball Bushings can be effectively used to reduce maintenance, starting loads and power consumption. Thomson Industries, Inc., Dept. BB, 1029 Plandome Road, Manhasset, N. Y.

## HYDRAULIC ELEVATING TABLES

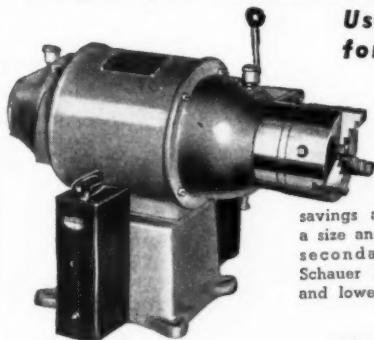
A new eight page bulletin describing Portable Hydraulic Elevating Tables is announced by Lyon-Raymond Corporation.

In addition to giving full descriptions of the various models offered in this line of equipment, photographs are reproduced showing the table in actual use for Die Handling, Strip and Sheet Feeding, Work Positioning, Loading Trucks and other jobs — practical working information.

The features of the tables shown are clearly set forth in descriptive copy supplementing the illustrations.

Copies of the bulletin can be obtained from Lyon-Raymond Corp., 3946 Madison St., Green, N.Y.

## Step Up Production--Reduce Costs!



Schauer Speed Lathe NA2B

### Use Schauer Speed Lathes for Secondary Operations

These small, inexpensive machines polish, lap, de-burr, or finish small metal and plastic parts 50% to 90% faster, more accurately and uniformly - and pay for themselves in product savings and lower production costs. There is a size and type of Schauer Speed Lathe for any secondary finishing operation. Learn how Schauer Speed Lathes can increase production and lower costs in your plant.

Write for Catalog 440

**THE SCHAUER MACHINE CO.**

2064 Reading Rd.

Cincinnati 2, Ohio

## For LONG WEAR Life

*Specify*

COMPACT DESIGN

HIGH TORQUE

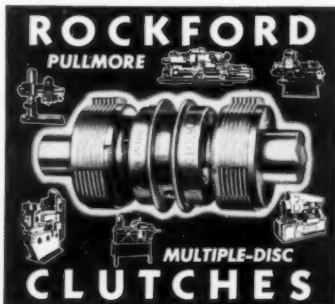
HIGH-RATIO LEVERS

POSITIVE NEUTRAL

PRECISION BUILT

LONG WEAR LIFE

EASY ADJUSTMENT



Heat-treated alloy steel provides wear-resisting bearing surfaces that are machined to close tolerances. The shifter spool has a deep slot, hardened and ground, which prolongs clutch life and reduces shifter fork wear. Discs have flat, true surfaces, free from high or low spots. Thus operating conditions remain uniform, even after long service.

### Send for This Handy Bulletin

Shows typical installations of **ROCKFORD CLUTCHES** and **POWER TAKE-OFFS**. Contains diagrams of unique applications. Furnishes capacity tables, dimensions and complete specifications.



**ROCKFORD CLUTCH DIVISION**

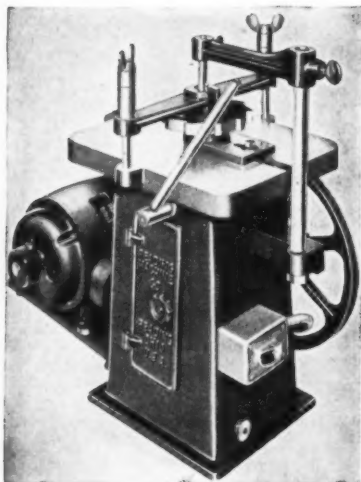
BORG-WARNER

1309 Eighteenth Ave., Rockford, Illinois, U. S. A.

Pullmore Clutches are sold by Motor Chain Co., offices in principal cities

# NO BUSHINGS, GUIDES or PILOTS NEEDED

## THE READING BROACH KEYSEATER



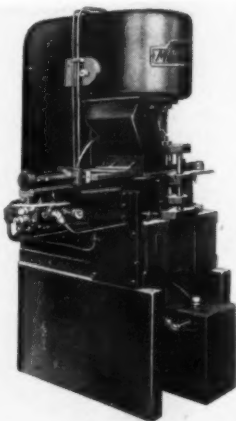
The Reading Bench Machine requires no bushings, guides or pilots. No other machine like it. Very fast—capacity from  $\frac{1}{8}$  to  $\frac{3}{8}$  cutter. Prompt delivery—low first cost.

**READING MACHINE CO.**  
READING (CINCINNATI) OHIO

## DENISON MULTIPRESS FOR PROCESSING GRANULAR MATERIALS

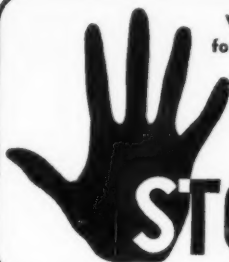
Plants which process powdered or granular forms of ceramics, plastics, or metals will be interested in a new automatic pelleting Multipress, according to the Denison Engineering Co., manufacturers. The unit is claimed to be able to process many materials formerly considered unsuitable for automatic production.

Features of the new Multipress include independent control of charging, compacting, and ejecting ram actions, easy cleaning, and quick die fill adjustment; it is suitable for single or multiple cavity dies, and either solid or cored parts. All ram actions are fully automatic and completely interlocked.



The Denison Vibratory control principle is incorporated in this press, in both the die charging and the compacting rams. Repeat strokes of the ram during compaction result in better expulsion of air from the die for greater control of part density, better distribution of material in the die, and a better finish on the edges of formed parts, according to the Denison engineers.

Denison has complete laboratory facilities available for "job-test" study of individual problems. Write for details to The Denison Engineering Co., Dept. BB, 1160 Dublin Road, Columbus 16, O.



Write Box 58B  
for New Catalog!

**MARSHALL STEEL**  
LISLE, ILLINOIS

**WASTING TIME ON CUTTING, SHAPING AND  
GRINDING DIE BLANKS—When you can BUY**

**Ready-to-use ...**

**GROUND FLAT STOCK**

**Also Production Surface**

**Grinding on Hugh Mattison Grinders.**

**SPECIAL SIZES HEAT-TREATED or SOFT,  
GROUND TO YOUR SPECIFICATIONS.**

#### THE CHRONOLOG SYSTEM FOR PRODUCTION MANAGEMENT

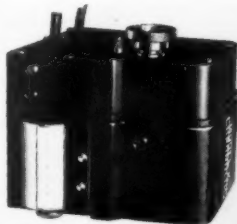
Plant management has long been searching for a satisfactory method of obtaining accurate, up-to-the-minute information on employee performance, reasons for machine down-time, and unquestionable records for the correction of controllable excesses. As an answer to this vital need for a precise record of the day's performance, the Chronolog idea was conceived. Free from human error, this record is a direct link between the plant employee and his superiors.

The Chronolog system provides a simple method for making available to the operator and his supervisor accurate records of pieces produced, reasons and durations of machine down-time, and all other incidents which occur during the day. This record is made available to those interested by means of the Chronolog Control report immediately at the finish of each work shift.

Among the advantages to management claimed for the Chronolog system of control is the fact that it points up the controllable losses in down-time and machine inefficiency, and reduces the number of non-productive employees, such as timekeepers, and factory clerks. It provides information for establishing production control standards, and es-

tablishes a means of arriving at accurate cost estimates. It provides a means of maintaining accurate and current control over scheduling and material movement.

The Chronolog is manufactured by the National Acme Co., Electrical Division; for information, write Dept. BB, Cleveland, Ohio.



## **"STAR DUST"**

**LABORATORY GRADED  
PURE DIAMOND POWDERS**

For GAUGES, TOOLS, DIES, etc., with tremendous **TIME SAVING**. These factors make **STAR DUST** indispensable in lapping and superfinishing on **HARDSTEELS, TUNGSTEN CARBIDE, CHROME**.

- Absolute control of particle sizes
- **STAR DUST** sizes as fine as .0001"
- Complete absence of out-size particles
- Complete range of grit sizes

*There is a **STAR DUST** Field Serviceman in your territory.*

**ACE ABRASIVE LABORATORIES**

**ONE SPRUCE STREET  
NEW YORK 7, N. Y.**

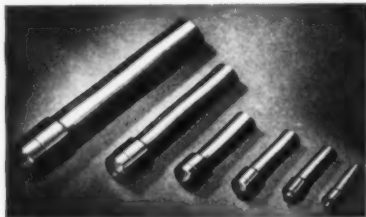
**STAR DUST** speeds up production enormously and produces finishes and superfinishes down to less than .00000004 of an inch.

**Precision LAPPING  
POWDERS for  
PRECISION work**



### ROTARY STOCK STOPS FOR LATHES

A complete line of rotary stock stops for automatics and turret lathes is announced by Barnaby Manufacturing & Tool Co. These stops are now available in eight sizes of from  $\frac{3}{8}$ " to 2" shank diameter, either with plain end or with center hole for burr. The smaller sizes can be furnished with full-diameter nose, or with small nose as illustrated to avoid interference with cross slide tools.

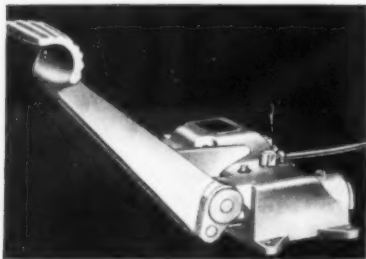


Barnaby rotary stock stops have a live head of oil-hardened steel which rotates freely with the bar stock, eliminating friction between the stock and the stop and thus preventing marring of the finished end during stock feed. This elimination of friction also reduces wear in screw machine mechanisms, and on turret lathes permits a production increase of 7 to 15% by reducing operator fatigue.

Bulletin available from Barnaby Manufacturing & Tool Co., 70 Knowlton St., Dept. BB, Bridgeport 8, Conn.

### LIGHTWEIGHT HYDRAULIC FOOT PUMP

A new lightweight hydraulic-action foot pump, stressing small size simple operation, is introduced by the Lyon-Raymond Corp. The unit is small and compact, designed with the pedal return

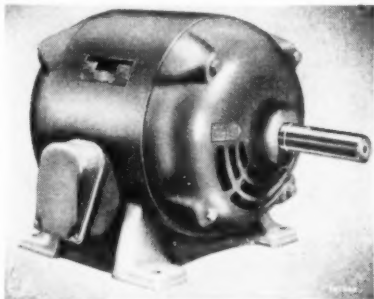


spring built inside the pump body, and the release controlled by raising the pump pedal slightly. Working pressures up to 1500 P.S.I. are claimed for this model. The usable oil capacity is 15 cu. in., the oil being contained in a sealed reservoir requiring no vent, allowing the pump to be mounted in offset positions if desired.

The flat base has three bolt holes for mounting. Features include a built-in oil strainer, an adjustable relief valve, and a chrome-plated piston for long-life operation. Additional data is obtainable from the Lyon-Raymond Corp., Dept. RS, 3841 Madison St., Greene, N. Y.

### WESTINGHOUSE "LIFE-LINE" MOTOR

Westinghouse announces a squirrel-cage induction motor of all-steel frame, feet, and end brackets, 35% smaller than its predecessor, without sacrifice in electrical properties. The motor is lighter, more rigid, and withstands greater impact. It is available in drip-proof, splash-proof, and fan cooled construction.



The new motor is of all welded construction, self-sealed, and is provided with pre-lubricated ball bearings allowing effective lubrication for five years or longer without repacking. The coil material is special synthetic resin covered wire; the rotor is dynetrically balanced.

Available in sizes from  $\frac{1}{2}$  to 20 hp, in voltages of 208, 220, 440, and 550; in double and triple phases; in 25, 50 and 60 cycle frequencies, and ten different speeds. Motors are furnished with NEMA Standard dimension frames, No. 203 to 326. Westinghouse Electric Corp., Dept. BB, Pittsburgh 30, Pa.

### NEW FLIP-QUICK DRILL JIG NUT

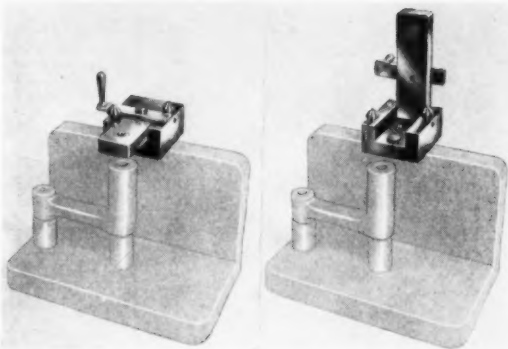
A newly designed jig unit, available in three sizes, has been placed on the market by Industrial Engineering Co. This unit enables the jig maker and designer to complete a jig more quickly, without the customary delays caused by the necessity of selecting a special design, then building the unit piecemeal.

Designed for fast operation, and precision built, these new jig units are produced in quantities, thereby keeping down their cost.

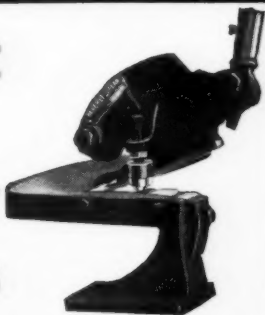
In operation, light push with one finger on the operating lever releases the lock, causing the bushing plate to throw back out of the way. Closing the bushing plate automatically locks it firmly, without shake. Both locking points are adjustable, and the unit can be reconditioned without the necessity of making new parts. A tapered hinge pin enables the tool maker to remove any play which might accumulate after

long service, and insures extreme accuracy from the start.

The new jig unit is designed and built by the Industrial Engineering Co. Additional information is available by writing to the manufacturers, Dept. BB, 730 E. Sample St., South Bend 18, Ind.



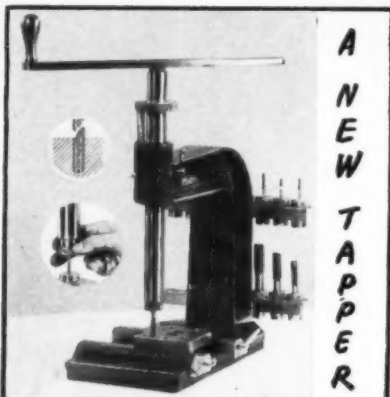
## CUT ANY SHAPE BETTER with BEVERLY Throatless SHEARS



The No. B-3 BEVERLY Bench Type Shear with Ball Bearing Hold Down handles 3/16" or No. 10 gauge stainless steel. This sturdy shear weighs 58 lbs. and is equipped with H. C. H. Blades for heavy duty service

*Let us send Bulletins giving full details on the BEVERLY LINE —*

**THE BEVERLY SHEAR MFG. CO., 3005 W. 110th Pl., Chicago 43, Ill.**



**BENCH MODEL NO. 12**

A new bench model hand tapping machine of proven advantages. Will save you time, taps and rejects on your tooling time and small lot production. Floor Type Tappers also available.

At your mill supply houses, or  
**THE LASSY TOOL CO., Plainville, Conn.**

## **BURGESS-MANNING INTAKE CLEANER-SILENCER**

Development of a new intake air cleaner-silencer for use on internal combustion engines, compressors or blowers, is announced by the Burgess-Manning Co. These units, designed as Series ICS, are available in pipe sizes from  $\frac{3}{4}$ " to 6". The design of these new units is quite unlike similar types previously available, since the non-ferrous filter element is quickly removable for replacement without the necessity of taking off screws or covers. Rugged snaps secure it in place and can be quickly released when filter removal is necessary. Complete information available from the Burgess-Manning Co., Dept. BB, 749 East Park Ave., Libertyville, Ill.

## **CORRECTION**

In the November 1947 Directory of the Machine and Tool Blue Book, the Larkin Lectro Products Corp., 156 W. 146th St., New York 30, N. Y. was listed only as manufacturers of Transformers. This firm should also have been listed under the classifications of arc, seam, and spot welders.



Model 7053—8 x 8 x 10

## **LUCIFER ELECTRIC HEAT TREAT FURNACES AUTOMATIC ELECTRIC CONTROL 9 MODELS**

- Muffle sizes 6" x 6" x 6" — 8" x 8" x 10" — 12" x 12" x 12"
- Temperature Range to 2000° F.
- Priced from \$123.00, F.O.B. Plant, Phila.
- Also Electronic Controlled from \$275.00

### **AGENTS**

Moslo Machinery Co.,  
2443 Prospect Ave.,  
Cleveland 15, Ohio.

Curt Loeser,  
4213 N. Newhall St.,  
Milwaukee 11, Wis.

The Satterlee Co.,  
118 Washington Ave.,  
Minneapolis 1, Minn.

Fuchs Machinery Co.,  
Jackson at 15th St.,  
Omaha 2, Nebr.

H. Leach Machinery Co.,  
387 Charles St.,  
Providence 4, R. I.

Sinour Machinery & Supply Co.,  
315 W. 7th St.,  
Sioux City 17, Iowa.

Lafayette Tool & Supply Co.,  
124 Lafayette St.,  
New York 13, N. Y.

Security Shoe Supply Co.,  
1830 Delmar Blvd.,  
St. Louis 3, Mo.

### **TERRITORIES OPEN FOR DISTRIBUTORS**

**GILBERT S. SIMONSKI,**  
LUCIFER FURNACE DIVISION

**401 N. Broad St.,  
Philadelphia 8, Pa.**

## Producers of Screw Machine Products to Specifications

ONE, FOUR and SIX spindle automatics maximum capacity 2 $\frac{3}{8}$ " round. Hand Screw Machines and Universal Turret Lathes maximum capacity 3" round. Castings and Forgings machined maximum 10" diameter, 8" length, 15 pound weight. Secondary operation equipment for milling, drilling, tapping and assembling. Fabricators of aluminum, brass, steel and their alloys.

### SCREW MACHINE SPECIALTY CO.

5600 Butler St., Pittsburgh 1, Pa.

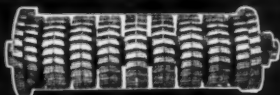
## CUT YOUR COSTS! (THE EASY WAY)

Send your cutting tools in today for Sharpening, Salvaging, Reconditioning

**SAVE UP TO 70%**

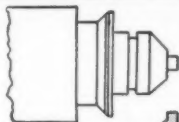
**Rutland**

13006 GREELEY



**TOOL SERVICE**

DETROIT 3, MICH.



WHY USE  
SEVERAL  
TOOLS  
WHEN ONE  
WILL DO  
THE JOB

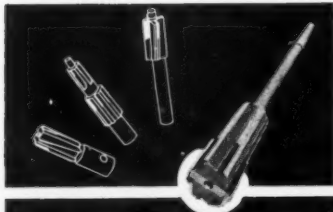
79 NEWBRIDGE ROAD

## FORM GROUND CARBIDE AND HIGH SPEED TOOL BITS

TERRITORIES OPEN FOR LIVE REPRESENTATIVES

**NEW MILFORD CARBIDE TOOL CO., INC.**

NEW MILFORD, N. J.



We are now ready to add more distributors to handle Schmarje Carbide-Tipped High Production Tools. If this interests you — write

**SCHMARJE**

**TOOL AND ENGINEERING CO.  
MUSCATINE, IOWA**

## PRATT & WHITNEY NO. 4D DIE SINKER

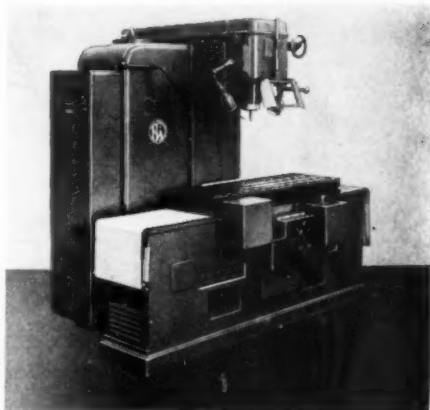
At the recent Machine Tool Show in Chicago, Pratt & Whitney introduced the new No. 4D Die Sinker—a machine that is different in appearance and principle, yet corresponds to the general capacity specifications of the original machine. It constitutes a new approach to the problem of providing the die maker with a more convenient efficient means of sinking impressions in modern tough die steels.

The new No. 4D Die Sinker produces original forging dies, die-casting dies, molds, and similar work on new high levels of accuracy, speed and economy. All machine motions are power operated, with speeds and feeds infinitely variable, but with all motions under effortless pilot hand control. With hand feeding eliminated, this machine fills the gap between conventional hand-operated die sinkers and full-automatic reproducing machines.

The three fundamental machine motions necessary for die sinking are provided through a longitudinally moving horizontal work table of fixed height, and a vertical slide carrying a transverse (cutter spindle) slide. Movements of these slides, always made under power, are governed by the new Pratt & Whitney "Directron" control which permits compounding any two components of travel.

For the machining of certain impressions having one or more areas of constant cross section, templates representing the various longitudinal or transverse cross sections are mounted on the machine, and these are traced in their respective planes by an electric follower which controls the corresponding machine motions automatically and with extreme accuracy.

All controls are concentrated at the front of the machine for maximum operating convenience. Longitudinal, transverse and vertical feed rates are infinitely variable, and rapid traverse movements are provided. Spindle speeds also are variable between 35 and 1750 r.p.m. The spindle itself has a new design ball-bearing collet closer of the wrenchless type to facilitate quick cutter change. The machine operates on standard A.C. voltage with the necessary D. C. provided by rectifier equipment furnished. Approximately  $4\frac{1}{2}$  h.p. is re-



quired. The P & W No. 4D Sinker weighs about 10,000 lbs. and is approximately 80" wide, 72" deep and 83" high. Distance from floor to top of table is 34", and from table surface to end of collet (minimum) 12", (maximum) 28". Complete information is available from Pratt & Whitney, Division Niles-Bement-Pond Co., Dept. BB, West Hartford 1, Conn.

### CARBIDE GRINDING BUR

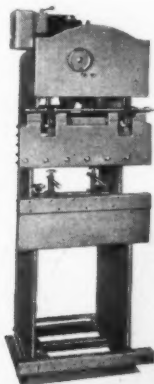
A new Carbide Grinding Bur has been announced by M. A. Ford Manufacturing Co., Inc. This tool was developed for internal grinding, jig grinding, and blending or fine finishing by off-hand grinding. It works equally well on soft materials or on steels hardened to 65 Rockwell C.

The "Ford" Carbide Grinding Bur is precision-ground on special machines, producing a uniform and truly concentric tool which gives maximum cutting efficiency. Greater improved performance as compared to abrasive wheels is insured by faster material removal—ability to hold hole shape and tolerances without dressing or set-up adjustments—finer finish—no loading.

Stocked in standard sizes from  $1/16"$  to  $3/4"$  tool diameter for operation in precision grinding equipment at conventional grinding speeds. M. A. Ford Manufacturing Co. Inc., Dept. BB, 780 West First St., Davenport, Iowa.

### KNIGHT ALL-STEEL PRESS BRAKE FOR SMALLER JOBS

A new press brake to fill the growing demand for a smaller, less expensive machine, has been developed by Knight Machinery Co. Identified as the 24-inch all-steel, welded Press Brake, this small unit is sturdily built and is designed for smaller jobs, thus enabling larger and more costly equipment to be released for work suitable to its specifications. Features of the new Knight Press Brake are said to include heavy welded construction, conveniently placed switches and speed control handle, enclosed moving parts (except ram between the up-rights) and a capacity ranging up to 18 gauge x 24" over 90° die.



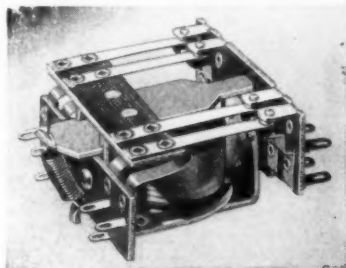
The Press Brake operates at speeds from 19 to 67 strokes per minute. It occupies a floor space of only 30" x 24"; the height is 69" over the motor and weighs only 1000 lbs. when skidded. Extra equipment is also available and consists of front operated gauges, extra width platen, light behind ram, dies and casters for easy moving. The Knight Machinery Co., Dept. BB, 1001 S. Delaware St., Indianapolis 2, Ind.

### NEW GENERAL-PURPOSE RELAY

Comar Electric Co. recently announced their new multi-purpose Type "C" Relay, designed for general circuit control applications. According to the manufacturer, this new relay has been specially engineered to provide high efficiency at low

cost and is readily adaptable to a wide range of relay requirements. It can be quickly mounted on base or panel, in any desired position, with terminals easily accessible.

The unit features a special Comar coil development which provides dependable

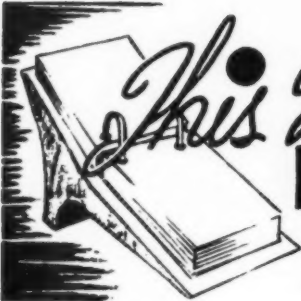


performance under all operating conditions. A single screw mounting simplifies coil removal. Average coil consumption is 7½ V. A. The contact current capacity is 5 amperes at 115 volts, AC. Wiping action of points insures positive electrical contact. The unit is available in any contact arrangement up to 4-pole double-throw. It can be supplied with fine silver contacts or other specified material if desired. Overall size, 2" x 2½" x 1¼". Weight 3 oz. For complete details, write Comar Electric Co., Dept. BB, 2701 Belmont Ave., Chicago 18, Ill.

## USED CARS



"Then too, it's been thoroughly road-tested"



# This Month's INDUSTRIAL FILMS

## **GOLDEN HORIZONS**

Ampco Metal, Inc.  
Milwaukee 4, Wis.

33 minutes. Color. Sound. 16 mm.

Obtainable from Ampco Metal, Inc.

"Golden Horizons" outlines the history and development of copper-base alloys. From those prehistoric days when primitive man accidentally discovered copper ore and fashioned crude tools or weapons, the action leads down to the modern use of copper-base alloys in industry. Shown are Egyptian slaves operating a bronze furnace, Sumerian metal workers bargaining for ore, the Swiss lake dwellers, a 17th century forge shop. Following the historical sequence the film pictures the modern use of bronze.

"Golden-Horizons" was produced throughout by employees of Ampco, producers of aluminum bronze and copper-base specialties. Sets were designed and built at Ampco; the actors are Ampco employees.

The picture provides an excellent opportunity to learn more about the history, development and use of copper-base alloys. The film is furnished without charge, user paying transportation charges one way.

## **PATHWAYS TO PROGRESS**

Clark Equipment Co.  
Buchanan, Michigan

25 minutes. Color. Sound. 16 mm.

Obtainable from Clark Equipment Company.

"Pathways to Progress" features close-up sequences of manufacturing processes out of the ordinary, such as forming a one-piece forged heat treated housing for commercial axles from a single rolled steel plate; making high speed twist drills by making forged blanks and twisting them white-hot into spiral form; silent riveting from one side of the work — the Clark "blind" rivet.

The film illustrates the diversity of



products manufactured by Clark Equipment Company and its divisions. It was originally introduced through prearranged sectional meetings throughout the country—each meeting attended by from 100 to 200 top management men representing customers and prospects, as well as offi-

cials of the company. Now, the film is being loaned to customers, prospects and college engineering classes.

Further information can be obtained from Mr. E. M. Schultheis, Advertising Manager.

#### HIGHWAY TO PRODUCTION

The Cincinnati Milling Machine Co.  
Cincinnati 9, Ohio

*30 minutes. Kodachrome. 16 mm. Obtainable from The Cincinnati Milling Machine Co.*

This film tells of the part machine tools have played in the human quest for material comforts. Most of the scenes are laid in the three plants and engineering offices at the Mill, and the thread of action is spun around the building of milling machines from iron-pouring scenes to final inspection.

The film is available upon request; there are no rental charges. The exhibitor pays return transportation charges only and is asked to fill out attendance reports and send them to the company at the time the film is returned. Two

or three alternative showing dates should be mentioned at the time the film is solicited.

#### HARVEY ALUMINUM AND BRASS PRODUCTS

The Harvey Aluminum and Brass Division of Harvey Machine Company, Inc., 19200 So. Western Avenue, Torrance, California, has announced, through Mr. Lawrence Harvey, Executive Vice President, that they have released the Harvey Aluminum Data Design Manual, which contains design data for commercial standard aluminum extrusions. Of particular interest, to designers and manufacturers of aluminum products, is complete information regarding Tolerances, Conditions of Heat-Treat, Nominal Composition and Typical Properties of Raw Aluminum Alloys and Coefficients of Thermal Expansion. Also included are tables showing typical Tensile Properties at Elevated Temperatures and Mechanical Property Specifications.

Also available, separately, is a Harvey Chart indicating the typical properties and machineabilities of all the various extruded aluminum alloys—as compared with free machining brass and steel.



#### Automatic Sizing on Universal Grinders for Internal Grinding with the Erickson TRUMATIC WHEEL DRESSER

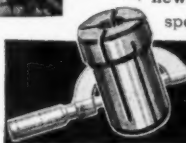


*Also, get catalog.*

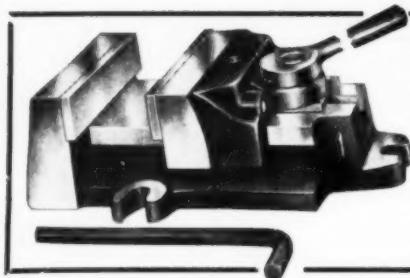
Save time and step up production. The Erickson Tru-Matic Wheel Dresser does both! No need to re-set the wheel by trial-and-error method after wheel dressing. It always remains on the machine—out of the way. An Erickson Precision Diamond Holder incorporating the Erickson collet permits turning to new facets—another big saving . . . Write for special literature.

#### ERICKSON TOOLS DIVISION

2301 Hamilton Ave.  
Cleveland 14, Ohio



**ERICKSON** = Collet Chuck Precision



### PLUNKET QUICK ACTION VISE for DRILL PRESS or MILLING MACHINE

Designed for production work, using an eccentric motion to apply pressure to jaws.

Eccentric motion moves jaw 5/16".

Size 6" jaws, 1 1/2" deep, opens 4".....**Net Price \$56.00**

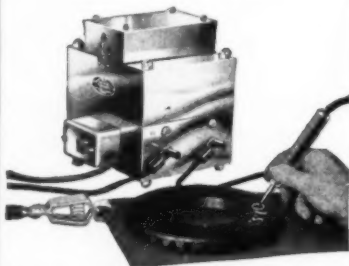
Pressure between jaws, with handle furnished, 2200 lbs. Net weight 36 lbs.

Our complete line includes Vises for Drill Presses, Milling Machines, Shapers, Grinders

**WRITE FOR CATALOG**

**J. E. Plunket Machine Co.** 1823 W. Lake St.  
Chicago 12, Ill.

### LUMA Master Etchtool



The master of them all. Meets every marking requirement in any shop. Has 24 stages of control for regulating depth of marking . . . from extra light to heavy. Will stand heavy continuous production on all kinds of metal, rough or finished. Write for details.

**Luma Electric Equipment Co.**  
P. O. Box 132-H Toledo 1, Ohio

### NO TROUBLES—If you have a . . .

### WALTON TAP EXTRACTOR



**When Taps  
Break Off  
in Valuable  
Work**

Broken Taps come out in a jiffy, when you start right . . . with a Walton Tap Extractor. Stock your tool crib today. Sizes No. 4 to 1 1/2", 2, 3, or 4 flutes. Prices range from \$1.50 to \$2.20 for the popular sizes. Write for price list and descriptive folder. No. 12.

### THE WALTON COMPANY

96 ALLYN STREET HARTFORD, CONN.



### INTERNAL THREADING AND BORING TOOLS

For holes from 1/8" upwards, 15 different sizes. The accurate thread angle is maintained through each sharpening until tool is entirely worn down. Small hand-long cutting surface for regrounding.

### COMET TOOL CO.

738 B'way, New York 3, N. Y.



**Write for  
Complete  
Data.**

# NEW TECHNICAL BOOKS

## AIR CONDITIONING

*By Herbert Herkimer and Harold Herkimer. Published by Chemical Publishing Co., Inc., Brooklyn 2, N. Y. 1947. 720 pages. \$12.00.*

Air conditioning provides, "in manufacturing, atmospheric conditions conducive to a standard quality and quantity of product. A humid indoor atmosphere is required for certain industrial processes, e.g., in textile mills, bakeries, cigar factories, etc. A dry indoor climate is desirable in the candy, match, photographic chemical, drug, explosive industry, etc."

The object of this book is to provide information on various phases of air conditioning, e.g., estimation, sales, production, installation, supervision, service, etc. It reviews the laws of chemistry and physics associated with air conditioning, and then goes on to the practical aspects of the industry, such as equipment, materials and costs.

Contents include Gas Laws, Elements of Health and Comfort, Cooling Load, Spray Systems and Cooling Towers, Drying Systems, Cooling Methods and Refrigeration, Central Systems, Estimating Costs, Appendix, Abbreviations, Symbols, and Conversion Table. Problems and their solutions and tables and illustrations make up a prominent place in the book.

The subject matter offers systematic training to students of air conditioning engineering, and should help engineers and other technical men to solve their problems in designing and repairing equipment, selecting materials and estimating costs.

## ELECTRIC MOTOR MAINTENANCE

*By W. W. McCullough, District Manufacturing and Repair Dept. Westinghouse Electric Corp. Published by John Wiley & Sons, Inc., New York, N. Y. 1947. 126 pages. \$2.00*

This book tells in simple, direct language how to maintain and repair motors. In this respect, certain schedules are suggested for inspecting and checking the condition of the motor at regular intervals. A motor service record form is even shown as an example of the sort of record to be kept. A list of equipment the inspector needs is presented, as well as the importance of clean apparatus and optimum temperatures.

Fundamental principles of electric motors are reviewed so that the reader will understand the transformation of energy taking place. Mechanical parts must be in condition before the motor operates correctly and smoothly. The author explains the functions of various parts of the motor—insulation materials, sleeve bearings, brushes and brush holders, etc.

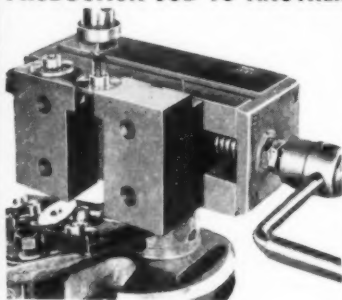
The material has been arranged to give the reader significant information on each phase of electrical motor maintenance. Other subjects discussed are The Induction Motor, The Direct-Current Motor, The Gear Motor, Motor-Generator Sets, etc.

The book is intended to help inspectors, mechanics, electricians and engineers take better care of the motors for which they are responsible.

## INDUSTRIES...ANSWERIGHT

*By Charles Z. Smith, Sr. 440 pages,*

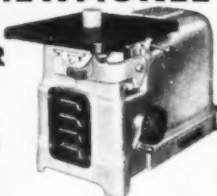
**"IT IS JAWS ONLY"  
NEEDED TO CHANGE FROM ONE  
PRODUCTION JOB TO ANOTHER**



**ON THE  
"JOHNS" DRILL JIGS  
HEUSER MFG. CO.  
1638 N. Paulina St., Chicago 22, Ill.**

## **The MILWAUKEE PROFILE GRINDER**

For  
Precision  
Grinding of  
Internal and  
External  
Profiles



High speed, reciprocating-spindle grinder.  
**FEATURES:** Low Cost; 20,000 RPM Spindle Speed; Surplus Power for Wheels up to 1 1/2"; 4-Way Tilting Table; Collet Chuck; Diamond Wheel Dresser. Supplements the MILWAUKEE DIE FILER.

Write for Bulletins on Both Machines.

*Milwaukee*

**CHAPLET & MANUFACTURING CO.**

**1027 S. 40th ST., MILWAUKEE 4, WIS.**

*mimeographed, 8 1/4 x 11 inches, leather cloth binding. Published by the Genflash Co., 105 Grove Ave., Albany 3, N. Y. \$6.00 postpaid.*

This is a book of problems and answers, tables and diagrams developed and used by the author while instructing classes sponsored by the U. S. Office of Education at Rensselaer Polytechnic Institute.

Outlines facilitate figuring dimensions for standard and special thread gages and tables show dimensions for several thousand plug and ring thread gages.

Detail drawings of thread plug gages, thread ring gages and interlocking and staggered tooth cutters may be used as guides for similar designs. A slide rule digit system is explained and examples are given. Eight-decimal place tables of all the natural trigonometric functions are also presented. The functions read in one direction for the full 90° with every number printed out in full. These tables are useful for precision measurement. Examples showing how to interpolate precede these tables.

Among problems solved are roll and ball measurements for checking dimensions; location of radii for jig boring dimensions; bevel gear, check face angle on sine bar; corrected tool steps on circular and flat form tools; spiral wound covering for cylinders; and dimensions for laying out developed surface of cone.

The book would be useful as an on-the-job reference and a refresher for home study.

• • •

### **FIN AND PIPE COIL ENGINEERING DATA**

34-page engineering data book provides fundamentals of pipe and fin coil calculation, such as heat transfer "K" factors for ranges of heating and cooling from minus 60 to plus 350 degrees F; recommended air velocities and fin spacing for fin coils; and calculation and design of pipe and fin coils for generally encountered heating and cooling loads. Inspection, testing and finishing of coils, calculation of heating and cooling coils, methods of computing fin coil surfaces, application of coils to particular types of heating and cooling units, and properties of saturated steam are other subjects treated.

Book costs \$1.50. Rempe Co., 340 N. Sacramento Blvd., Chicago 12, Ill.

# News of the ..... industry.....

## **HANDY & HARMAN AND THOMAS J. DEE & CO. JOIN FORCES**

G. N. Niemeyer, President of Handy & Harman, Harry E. Radix, President and Thomas G. McMahon, Secretary-Treasurer of Thomas J. Dee & Company, have announced that their two concerns have joined forces.

This affiliation brings together two long established successful companies which have had close business relationship for many years.

Handy & Harman (1867) a leading refiner and producer of silver and gold alloys for the Arts and silver brazing alloys and other silver products for Industry has its principal plant in Bridgeport, Connecticut, a plant in Toronto, Canada, and service plants in New York, Providence and Los Angeles.

Thomas J. Dee & Company (1889) activities include the making of products for the dental profession and trade, jewelry trade and chemical and other industries with its plant in Chicago.

Thomas J. Dee & Company will become the Dee Division of Handy & Harman and will continue to function under Harry E. Radix and Thomas G. McMahon and the present plant executives and personnel. It will maintain the present downtown Chicago office in the Pittsfield Building, 55 East Washington Street. Handy & Harman's Chicago office will move from 20 North Wacker Drive to the Dee Division plant at 1900 West Kinzie Street.

## **SWISS SUBSIDIARY FORMED BY MINNEAPOLIS-HONEYWELL**

Organization of a new subsidiary company in Switzerland has been announced by Harold W. Sweatt, president of the Minneapolis-Honeywell Regulator Company, Minneapolis, Minn.

Named Honeywell A. G., the new company has started operations with completion of legal formalities and the hiring of operating personnel. The Swiss organization will handle sales and service of the complete line of Honeywell controls as well as all of the industrial recording and controlling devices made by the Brown Instrument Company, wholly-owned Honeywell subsidiary.

Intensified interest in automatic heating as well as growing industrial activity in Switzerland were cited by Sweatt as reasons behind the formation of the new company.

## **CARBOLLOY APPOINTS HOLCOMB CO. AUTHORIZED DISTRIBUTOR**

A. L. Holcomb Company, 15 Market Ave., N.W., Grand Rapids 2, Mich., has been appointed an authorized distributor for Carboloy Co., Inc., Detroit, Mich. They will supply users throughout Northwestern Michigan. Carboloy standard tools, standard blanks, carbide tipped masonry drills, and diamond impregnated grinding wheel dressers will be carried in stock. R. R. Miller, Vice President and Sales Manager of Holcomb, will head the new Carboloy operation.

## **MODERN PLANT OFFERED FOR RENT**

The owners of a modern plant capable of fine precision machine work and situated in Worcester, Mass., are interested in renting their plant facilities. Over 30 machine tools, including 7 lathes, 6 millers, 6 hand screw machines, 12 drill presses and 11 grinders, comprise the equipment.

Those interested in renting may write to the Editorial Department, MACHINE AND TOOL BLUE BOOK, 542 S. Dearborn St., Chicago 5, Ill.

SAVE ON LIGHT PRESSWORK  
WITH A

**famco**

## FOOT PRESS



● Production line economies are accomplished wherever one or a whole battery of Famco Foot Presses are used to do light punching and forming jobs. They're putting pep into production at Webster Electric Co., Racine, Wis. and hundreds of other plants. They eliminate bulky, electricity-consuming equipment . . . may be located anywhere. Write today for full details on the ten sturdy models now available.



### OTHER POWERFUL MACHINES THAT NEED NO POWER

◀ Famco Arbor Presses, in 32 models, bench and floor mounting will deliver up to 15 tons pressure . . . require no electric power.

Famco Foot-Powered Squaring Shears will cut up to 18 gauge mild steel with accuracy and speed. Ruggedly constructed and available in five sizes.



FAMCO MACHINE CO. • 1320 18TH ST. • RACINE, WIS.

**famco** **machines**

COST  
CUTTING

• SQUARING SHEARS

ARBOR PRESSES • FOOT PRESSES

### MELIN TOOL TAKES OVER FERRIOT SALES RIGHTS

The Melin Tool Company of Cleveland, Ohio, and Grand Rapids, Michigan, recently acquired the world-wide sales rights to products manufactured by Ferriot Bros., Inc., of Akron, Ohio.

Ferriot Bros. pigmy power tools, such as the Powermax Air Tool and the Powermax Cost Alloy Rotary Files have already earned for themselves an excellent reputation in the small cutting tool field. The newly acquired plant at 3370 W. 140th St., in Cleveland will be the center of distribution.

### INDUCTION HEATING CORP. MOVES

The Induction Heating Corporation, manufacturers of THER-MONIC Induction and Dielectric Heating equipment, announces that it has moved to its recently completed quarters at 181 Wythe Ave., Brooklyn 11, N. Y.

### BENCHMASTER APPOINTS SALES MANAGER

The appointment of J. K. Sutherland as sales manager of Benchmaster Manufacturing Company, 2960 West Pico Boulevard, Los Angeles 6, was announced recently by G. D. Florence, president of the company.

Mr. Sutherland comes to Benchmaster from Diamond Machine Tool Company, Los Angeles, where he has been sales manager for the past four years. A long-time member of the American Society of Tool Engineers, he may also be remembered as a prominent exhibitor of machine tools.

### MANUFACTURERS COMBAT STEEL SHORTAGE BY BUYING MILL

Twenty-five manufacturers from New York to California, with products including kitchen stoves, lawn mowers, furniture and advertising signs, have purchased an ingot-producing steel mill at Phoenixville, Pa. it was announced recently by Arnold H. Maremont, group's president. The purchase was made in order to supply ingots for a sheet mill at Apollo, Pa. which the syndicate bought when it was organized last December. The new acquisition completes a program for meeting the manufacturers' steel needs.

The mill, which began operations September 15, contains six open hearth furnaces and three rolling mills, and will provide enough steel to enable all manufacturers in the group to operate at full capacity while all excess steel will be sold to other consumers, Maremont said.

### SKF SPENDS FOUR MILLION ON EXPANSION

A two-year modernization and expansion program, that will find SKF Industries, Inc., spending more than \$4,000,000 to equip its two Philadelphia plants with new machinery is announced by Thomas W. Dinlocker, vice president.

While the bulk of the expenditures will go for new machinery required in the production of anti-friction bearings, the program is aimed primarily at stepping up production of spherical roller bearings.

Some of the new machinery already has been installed, still more is being designed and built in cooperation with machine tool firms, and certain types of new equipment required in exclusive SKF processes are being built in the company's own machine shops, Dinlocker said.

Additional floor space for increased production of spherical roller bearings, widely used in the rail equipment, steel, paper-making and other industries, is being gained in the Philadelphia plants, Dinlocker said, despite a severe building crisis in the area. The company's metal stamping and cast iron departments were transferred beginning July 15 to newly-acquired plants at Shippensburg, Pa., and Hornell, N. Y., to clear space in the main plants. The two new plants are scheduled to begin operations soon.

### HERBRAND AND BINGHAM MERGE

The merger of The Herbrand Corporation, Fremont, Ohio, manufacturers of standard tools and special drop forged parts, into The Bingham Stamping Company, Toledo, manufacturers of brake lever assemblies for automobiles and trucks, and other stamping products, was made effective recently at a meeting of the stockholders of both companies. Combined future operations will be conducted under the name of The Bingham Stamping Company.

### RIDLEY REPRESENTS HANNIFIN IN NORTHERN CALIFORNIA

Hannifin Corp., 1101 S. Kilbourn Ave., Chicago, Ill., announces the appointment of The Ridley Co., 320-11th Street, San Francisco, as representative for their line of hydraulic and pneumatic power and production equipment in northern California. Representative in southern California is Tornquist Machinery Co., 931 Santa Fe Ave., Los Angeles.

### THRIFTMASTER MOVES TO PENNSYLVANIA

Thriftmaster Products Corporation, formerly a Division of Thompson Industries, Inc. and situated in Long Island City, New York, has recently moved its entire operation to Lancaster, Pennsylvania.

Mr. H. K. Ferger continues as General Manager of the Corporation and H. E. Scott is Plant Engineer.

### BROOKS AND PERKINS INCORPORATES

Announcement of the formation of Brooks & Perkins, Inc. is made by E. Howard Perkins, President. This new Michigan corporation has acquired, and will continue, the business of the former Brooks & Perkins, a partnership, fabricators of magnesium parts and products.

In addition to Mr. Perkins, the officers are Vice-Presidents: Oliver N. Brooks and Paul A. Day, Treasurer: K. C. Reeves, Secretary: Frederick W. Seitz.

Clifford W. Sponsel is Vice-President in charge of fabrication; Harold W. Lucas, Assistant Treasurer; and Charles I. Vogel, formerly in charge of the New York Brooks & Perkins branch office, has been named Sales Manager.

### PROGRESSIVE ACQUIRES WARREN ALLOY

Announcement has been made by John D. Gordon, General Manager, Progressive Welder Company, 3050 E. Outer Drive, Detroit 12, of the acquisition of the Warren Alloy and Machine Company of Warren and Detroit, Michigan. Warren Alloy and Machine Company has been operating a non-ferrous foundry in Warren and a jig, fixture, die, gage and punching unit plant in Detroit.

The acquisition of the non-ferrous foundry will give Progressive Welder Company a direct source of heat-treated alloy castings required in the manufacture of resistance welding equipment.

### PHILADELPHIA INDUSTRY LABOR FORM VOLUNTARY JOINT MEDIATION GROUP

Formation of an organization for the voluntary settlement of labor-management disputes without recourse to government intervention has been established in Philadelphia as a means of preserving industrial peace in the nation's third largest city.

Known as the Philadelphia Mediation Council, it consists of an advisory and policy-making board of six management and six labor representatives.

### UNITED ALUMINUM MOVES

The United Aluminum Castings Company expanded its facilities by moving into its new, modern equipped plant at 3471 West 140th St., Cleveland 11, Ohio. The firm, headed by Leo J. Gardner, has increased its capacity from forty-thousand pounds to an ultimate capacity of three-hundred-thousand pounds, per month, in the new building which occupies 7500 square feet. The company is now geared for the faster production of aluminum castings as well as castings of aluminum alloy.

### SOUND DISTRIBUTION SYSTEM ORDERED BY NATIONAL LOCK

A comprehensive sound distribution system has been ordered by the National Lock company, Rockford, Ill., according to Carl F. Megelin, president of Communi-Sound, Inc., Chicago.

"The system will cover the entire plant and office area," Megelin said, "covering all ten buildings, some of them six stories in height.

"When completed, 255 speakers will be using total power requirements of 1,500 watts."

The new sound system should be in operation about October 15 and will be used for paging and special announcements; for broadcasting sporting events such as the World Series; and for music distribution.

### ALLIS CHALMERS EXPAND PITTSBURGH WORKS

A construction and expansion program to cost several million dollars was announced for the Pittsburgh Works of the Allis-Chalmers Mfg. Co., Milwaukee, Wis., by President Walter Geist, following a meeting of the company's directors in Pittsburgh.

The first major expansion of the Pittsburgh property since its purchase in 1927 by Allis-Chalmers will include a new 250 x 400 foot building which will be devoted largely to production of transformers, major item manufactured by the company at Pittsburgh. Another smaller building at the New River plant will be used for shipping.

According to Geist, present employment of 1,600 at Pittsburgh will be increased from one-fourth to one-third and productive capacity expanded by about 50 percent. Construction of the new facilities began July 1 and are expected to be completed about Nov. 1.

### AMERICANS CONVERTING HOMES TO 'FACTORIES'

More than 80 per cent of the people now building dwellings are specifying home workshops equipped with up-to-the minute portable power tools.

Upwards of 850,000 homes—60 per cent more than before the war—now have workshops, and the demand for workshop equipment is steadily increasing, says R. Robert Zisette, general sales manager of SKF Industries, Inc., Philadelphia, in a report on production of small anti-friction bearings for home workshop equipment.

"A decade ago, only 10 per cent of the nation's home owners and buyers were interested in a workshop," Zisette declares, "but today the demand is for ultra-modern machines that transform such hobbies as cabinet making, antique finishing and a host of light building and repair chores into skilled avocations."

The home workshop's sudden popularity stems from several factors, the SKF executive points out. These include high building costs and material and labor shortages, manual and technical skills acquired by thousands of people during the war and more leisure time now enjoyed by more people.

"Sales of anti-friction bearings alone indicate a sizeable increase in production of small electric motors for portable tools," Zisette says, adding that current output of these items is running at better than 1,000,000 per month.

He listed the most popular home workshop tools as the jig saw for cutting curved lines, the lathe for turning and shaping wood, and the motor driven bench saw for fast, straight cutting.

### ORLANDI AWARDS SALES RIGHTS

Award of national and foreign sales rights for Orlandi Gear Checker has been given Michigan Tool Co., 7171 East McNichols Rd., Detroit 12, Mich., according to an announcement made by A. S. Orlandi, President of Orlandi Gear and Machine Co., Detroit.

### LAPEER BUYS KNU-VISE

The Lapeer Manufacturing Co., Lapeer, Mich., has taken over Knu-Vise, Inc., Detroit, and the manufacture of that company's toggle-action clamping devices, which will continue to be known as Knu-Vise Products. The Knu-Vise executives will assume management of the new company. The sales office will remain at the Detroit address, 2208 Eighth St.

# Available LITERATURE

## GREENLEE TRANSFER & SCREW MACHINES

Greenlee Bros. & Co. are offering two bulletins, one on transfer machines and the other on a new screw machine. The first presents a well illustrated eight-page, two-color bulletin tracing the development and use of Automatic Transfer Processing Machines. Photos, production figures and illustrated operation charts tell the story of progress.

The other is a four-page, two-color bulletin which illustrates and describes a new threading attachment and arrangement for Greenlee four-and-six-spindle automatic screw machines capable of interchanging with conventional equipment.

Greenlee Bros. & Co., Rockford, Ill., on company letterhead.

## CHIP-BREAKER CHART

A new chip-breaker chart containing detailed drawing and information on preparation of four types of chip-breakers is now available. This chart has been prepared by the Wendt-Sonis Co., Hannibal, Missouri, manufacturers of a complete line of carbide-tipped cutting tools.

Included on the chart are tables showing recommended width of chip-breakers and a grinding summary.

The chart has been made up calendar style, suitable for hanging near to the machine. Wendt-Sonis Co., Dept. BB, Hannibal, Mo.

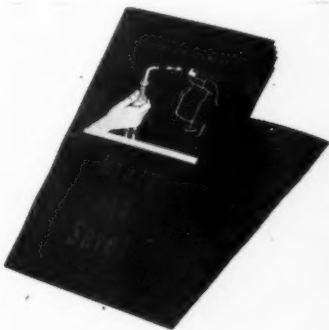
## BEHR-MANNING FLOCK-FINISHING

Behr-Manning, manufacturers of cut-to-length rayon flock announce a 10-page booklet on Flock and Flock Finishing.

Contains 24 color sample swatches, describes the adhesives, methods of applying adhesives and flock on various surfaces, outlines the company's engineering service and lists the numerous decorative and functional uses for flock. Behr-Manning, Dept. BB, Troy, N. Y.

## BRAZING CARBIDE

12-page booklet gives instructions on how to braze carbide with maximum efficiency and economy. Materials and equipment required are described, as well as the art of brazing by torch, furnace or induction and "sandwiching"



braze. Explanatory drawings supplement description of operations. Booklet should be helpful to those considering the brazing of carbide tool tips or wear parts, as well as in larger shops as a training aid. Adamas Carbide Corp., Dept. BB, 1819 Broadway, New York 23, N. Y.

## NATL. SUPPLY SLUSH PUMP

The National Supply Company has issued a 16-page bulletin (No. 326) on its Ideal power slush pump Type C-350. The bulletin gives product details, cutaway and "explosion" illustrations, performance chart, and specifications, and describes the pump's general and special features. One of the features is its patented baffling system that prevents mud contamination of crankcase oil. The National Supply Co., Box 899A, Toledo 1, Ohio.

# Precision . . . . TAPPING

*Leads  
changed  
in 90  
seconds*



## M & L PRECISION TAPPER

This is a fast rugged production tool capable of sustained accuracy. Flexible and adaptable, it cuts clean screw threads, handling up to  $\frac{3}{4}$ " in non-ferrous metal and 0 to  $\frac{1}{2}$ " in SAE steel. Class 3 and Class 4 gage fits and high production schedule are accomplished in normal operation even with unskilled help.

Tapping speeds are 95 to 350 rpm with reverse speed twice that of forward speed. Taps are guided by precision ground lead screws which are easily and quickly changed. Bulletin 143 gives full details.

**Dealers' inquiries  
are invited**

### LECKINGER

**MACHINE AND EXPERIMENTAL CO.**  
716 N. Highland Ave., Los Angeles, Calif.



## MOUNTED WHEELS ON PORTABLE GRINDERS

Methods for increasing production, improving workmanship and reducing costs with light portable grinding equipment are described in Mounted Wheels, the new 32 page illustrated handbook just published by The Carborundum Company.

The wide range of wheel shapes and sizes, the variety of abrasives and



coated abrasive discs, sleeves and cart-ridge rolls available for use on light-weight, high speed portable grinders are discussed and depicted. Photographs and diagrams are used to provide correct identification and selection . . . to illustrate careful handling and storing and to show proper and efficient applications. The Carborundum Co., Niagara Falls, New York.

## PATHON CYLINDERS

11-page bulletin describes six models of Air Cylinders available from Pathon Mfg. Co. There is a good view of each type, both by photo and diagrammatic drawing, in addition to complete description and specifications. A typical cylinder is presented by means of a crosscut drawing. There is also descriptive material about cushioning and ram pressures. Pathon Cylinders are fabricated in both cushioned and non-cushioned types and may be had with either a plain or threaded ram. Pathon Mfg. Co., Dept. BB, 6801 Vine St., Cincinnati 16, Ohio.

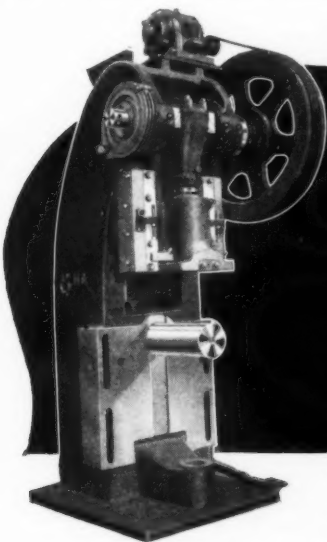
#### ELECTRIC FEEDRAIL

28-page catalog offers a compilation of recent developments in the application of the Electric Feedrail distribution system as applied to portable lights and tools, moving test lines, cranes and hoists and other industrial applications.

Included in this book are diagrams for layouts, methods of mounting, sections for curves and transfers and a complete line of trolleys with self-contained meters, circuit breakers, relays and limit switches. Also illustrated are applications of Feedrail as applied to production and assembly lines, work benches and many types of portable electrical equipment. Feedrail Corp., 125 Barclay St., New York 7, N. Y.

#### NICKEL AND NICKEL ALLOY TUBING

Superior Tube Company announces publication of Catalog Section 10 on Nickel and Nickel Alloy small tubing—.010" to  $\frac{3}{8}$ " max. O.D.). Comparative tabular data gives the physical and chemical characteristics of Nickel, Monel, "K" Monel, Inconel and Cupro-Nickel. Details of selection and application for these alloys has been compiled for easy reference; and practical working tables are included on commercial tolerances, standard production limits, ordering data, and Superior tempers. Request on company letterhead to Superior Tube Company, 2194 Germantown Avenue, Norristown, Pa.



# THOMAS

## HORNING PRESSES

*Available for  
Reasonable Deliveries*

**Send for Bulletin 212 A**

These Horn Type Presses can be had in 56, 80 and 106 ton capacities. They are built to the same high standards and specifications of our well-known Inclinable Presses. Special attachments may be installed as desired.

P-4

### THOMAS

MACHINE MANUFACTURING COMPANY

PITTSBURGH, 23, PA.

### **O.K. TOOL MILLING CUTTERS**

The O. K. Tool Co., Inc., of Shelton, Conn. announces a new, sixty-page, two-color catalog entitled, "Modern Milling Cutters for Modern Milling Machines." This booklet presents information on all O.K. Tool milling cutters, reamers, boring heads, counterbores and special design tools. It also contains material pertaining to the use of carbides in milling with a full page chart on feeds and speeds for operating. Each subject is illustrated with photographs or line drawings.

### **TITAN WELDING RODS**

Titan bronze welding rods are described in a new 6-page folder just issued by Titan Metal Manufacturing Co., Bellefonte, Pa. The approximate chemical and physical properties of seven types of welding alloys are included in table form. Also included are instructions on how to use the rod, together with photographs of sample work done with the rod.

### **PITTSTON COAL EMPIRE**

A four-color, 36-page brochure by the Pittston Company and its associated corporations gives a graphic picture of their activities, with emphasis on the mining, shipping and distribution of bituminous coal. The activities of all the companies are described in the pictures, captions and text. Typical scenes are those at the Clinchfield Coal Corp. in Southwest Virginia, showing the coal preparation plants, cleaning plants, the school and recreational facilities, general store, miner's homes, etc. The Pittston Co. Dept. BB, 6417 Empire State Bldg., 550 Fifth Ave., N. Y. 1, N. Y.

### **HANNIFIN HYDRAULIC CYLINDERS**

52-page illustrated bulletin discusses 11 versatile standardized mounting styles, which solve power application problems without involving special designing and construction. The use of differential hydraulic circuits to provide a fast return stroke in cylinder operation is also discussed and illustrated. The reference data section of the bulletin covers formulae and data for solving hydraulic cylinder problems and a discussion of pressure drops in piping, pipe sizes, and fluid velocity in pipes. A check list covers points for specifying cylinders and designing installations.

### **PRATT & WHITNEY DIE SINKERS**

Plain and Universal Pratt & Whitney Die Sinkers, two sizes of each displayed in 11 page catalog. The machines are not basically new, but all are portrayed in latest form. The Nos. 2B and 3B plain Die Sinkers are intended primarily for all-around die shop use where the majority of cuts are straight, but are designed for the fitting of a Cherrying Attachment. The Nos. 2B and 3B Universal will do everything the Plain machines do, and will also take cherrying cuts using standard die sinking cutters. Pratt & Whitney, West Hartford 1, Conn.

### **BALDWIN PRESSES**

12-page bulletin details features and specifications of Baldwin Southwark line of steam platen presses. 23 photographs illustrate miscellaneous types from the standardized line to the custom-built. Hydraulic accumulator systems, triplex pumps, plastic molding presses, and die hobbing presses are described. Baldwin Locomotive Works, Eddystone, Pa.

### **TOOLROOM PLANNING**

Lindberg Engineering Company has prepared a 24-page booklet, "How to Plan Your Toolroom Heat Treating Department." It tells how much a complete toolroom heat treating department will cost and how to select furnaces of the proper size, shows pictures of recom-



mended layouts, gives approximate floor space requirements, and shows prices of auxiliary equipment such as tongs, quench tanks, straightening presses, work benches, hardness testers, etc. Special "template" pages of furnaces, quench tanks, etc., are included. With a few seconds scissor-work, the contemplated toolroom may be set up. Lindberg Engineering Co., 2444 W. Hubbard St., Chicago 12, Ill.



**If you want  
MORE PARTS per hour  
LOWER COST per part**

the BARKER WRENCHLESS CHUCK can do it faster, better and stand up to it longer. Where the run is continuous on turrets, engine lathes, cutting off machines, drill presses or any other type of chucking machine, these Chucks will increase production and pay for themselves in 60 to 90 days while

doing it. See how a Barker Wrenchless Two-Jaw or Three-Jaw Chuck can speed up production in YOUR plant.

Write for Bulletin 201 Today.



**—Chuck Division—**  
**THOMAS HOIST CO.**  
24 S. HOYNE CHICAGO 12



**SAVE HANDS  
WITH STRANDS**

**SAFGUARDS  
FOR PUNCH  
PRESSES**

*Send for Enclosure  
and  
Sweep Safeguard  
Circulars.*

**STRAND MFG. CO., INC.**  
**SAFETY ENGINEERS**  
607 West Lake Street Chicago 6, Ill.

### HYDRAULIC ACCUMULATOR BOOKLET

A 20-page, 2 color book on Hydraulic Accumulators has just been published by Greer Hydraulics, Inc.

The first section of the book describes in detail the history and development of the accumulator, giving a brief description of the various types which have been used to date with the advantages and disadvantages of each type. Following this brief history of the accumulator is an outline of the main feature of the Greer unit. Construction details, materials, principles of operation, performance charts, and other engineering data are also covered.

The second part of the booklet illustrates some typical applications of the accumulator representing the various uses to which the unit can be put. Schematic drawings and other illustrations of actual circuits are shown. Write on your company letterhead to Greer Hydraulics, Inc., 454 Eighteenth St., Brooklyn 15, N. Y.

### ADJUSTABLE PERFORATING DIES

S. B. Whistler & Sons, Inc., are offering two catalogs, one No. 47 on Adjustable Perforating Dies for perforating materials up to and including  $\frac{1}{8}$ " mild steel, the other 47A on Dies for perforating materials up to and including  $\frac{1}{4}$ " thick mild steel. Diagrams of various die assemblies are shown throughout both catalogs. Sizes, shapes and applications of Whistler Dies are featured.

Also included is information on the new U-375 Adjustable Perforating Dies permitting minimum perforating centers of  $\frac{1}{8}$ ". S. B. Whistler & Sons, Inc., Dept. BB, Buffalo 17, N. Y.

### WESTINGHOUSE ROTOTROL

What Rototrol is, what it does, and how it works, is outlined in a new Westinghouse 36-page booklet on automatic operation for electrical equipment.

The booklet explains how Rototrol regulates voltage, speed, current, power, speed and torque, power-factor, and position, and provides stability control and current limiting. Photographs, schematic diagrams and performance curves are used to describe Rototrol applications in the automotive and aviation, central station, construction, machine tool, marine, metal working, mining, paper, rubber, textile and other industries.

Westinghouse Electric Corporation, Dept. BB, P. O. Box 868, Pittsburgh 30, Pa.

### FAFNIR BALL BEARINGS

Information about light series pillow blocks, flange cartridges and cylindrical cartridges equipped with sealed wide inner ring ball bearings is contained in a new 8-page folder, LAK. The units described are widely used for carrying light or normal loads in applications where simplicity of installation is an important factor.

Photograph, sectional drawings, specifications and load ratings are included.

The Fafnir Bearing Co., Dept. BB, New Britain, Conn.

### GENERAL ELECTRIC'S CONTROL SWITCH

Bulletin GEA-4746, a 12-page, two-color publication describes General Electric's type SB-1 control and transfer switch.

Photographs and exploded views show the construction of the switch, both for single-stack and tandem units and typical applications are described. Apparatus Dept., Dept. BB, Gen'l. Electric Co., Schenectady, N. Y.

### SQUARE D DIGEST

74-page catalog includes size, capacity and dimensional data, together with current prices on industrial safety switches, service equipment, multi-breakers, industrial circuit breakers, lighting and power panelboards, etc. Illustrations are abundant and tables aid in proper selection of devices. Square D Co., Dept. BB, 6060 Rivard St., Detroit 11, Mich.

### ALCOA TEMPER DESIGNATIONS

Aluminum Company of America has developed a revised system of aluminum alloy temper designations to overcome inadequacies in present system and provide a definite pattern for future developments. One example of how the present system is unable to fulfill current requirements is found in alloy 24S, the most widely-used wartime aircraft material. Government specifications recognize the fact that 24S-T flat sheet has higher properties than may result from heat-treating a formed 24S-T part. Under the present system, however, designers have no way of distinguishing on the drawing boards what kind of 24S-T they mean. A more comprehensive system for both cast and wrought products is set forth in 15-page booklet. The new system becomes effective on all Alcoa shipments made on and after January 1, 1948. Aluminum Company of America, Pittsburgh 19, Pa.

## OPTICS FOR GRINDING

*Check* YOUR CARBIDE  
TOOL ANGLES

with



**OPTI-CHECK**

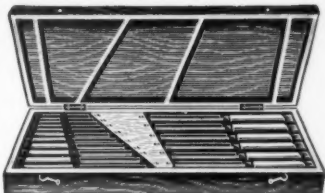
- Magnifies Tool
- Magnifies Reading
- No Fussy Juggling
- Accuracy  $\frac{1}{4}$  Degree
- Makes Duplication of Sharpening Angles Easy.
- Checks Drills, Cutters, etc.

*Write to*

**THE BENTON CO.**

DEPT. H 351 S. LA BREA, LOS ANGELES, CALIF.

## HAND REAMER SETS



- Hand Reamer Sets, consisting of 33 reamers, one each from  $\frac{1}{4}$ " to  $1\frac{1}{4}$ " by 32nds.
- Each set is contained in well built oak chest with hinged cover.
- Chest has two compartments grooved to hold each size reamer.
- Regular value — \$90.00 —

**OUR PRICE — \$25.00**

Send for our catalogue of cutting tools.

**VETERAN TOOL & SUPPLY CO.**

88 Baxter St., New York City

**SAVE TIME**  
on intricate, angular  
**SET-UPS**

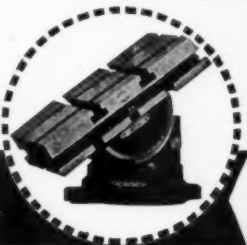
Fully universal . . .  
three swivels simplify the  
setting of compound angles.  
Parts interchangeable . . . can  
be used as a plain flanged vise,  
a swivel vise or multi-swivel vise.

Write for  
name of  
nearest distributor



*Multi-Swivel*  
**WISE**

The Platen increases capacity of the  
unit. Vise and Platen are interchangeable.



**MASTER TOOL CO.**

161 HIGH STREET • BOSTON MASS.

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

# Shop Hints

## INSTALLING OLD TYPE LATHE IN MODERN SHOP

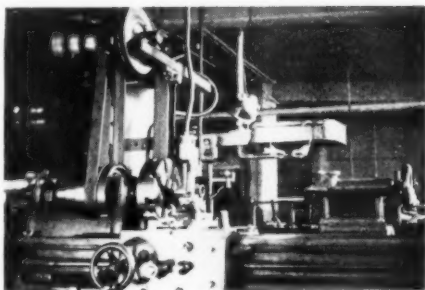
By Lyle Bryant

When we purchased an old type lathe we did not want to install any overhead countershaft and motor support system as our shop was modern and all equipment had individual motor drives. We decided to make a new drive unit for this machine.

The first step was to cut a piece of  $\frac{3}{8}$ x4 in. angle iron long enough to fit between the two rear legs of the lathe. Then this angle was bent to set against the legs, with the balance of the angle vertical, and bolted to the legs about 10 in. from the floor. The next step was to cut 2 pieces of 3x4 in. I beam 6 ft. long, which were bolted to the angle iron outside the back of the lathe in an upright position. On our machine the spacing between these was 18 in. (the distance between the headstock bearings). The upper ends of the I beam were cut to a channel section 5 in. from the upper end and on the sides of the beams facing each other, to allow a solid  $1\frac{1}{2}$ " bearing to swing freely.

One  $1\frac{1}{2}$  in. hole was drilled through the web of the I beam 2 in. from the top and in the center, to allow a  $1\frac{1}{2}$  in. shaft to pass through in line with the headstock centers.

To brace the upright beams a channel was made up using two 24 in. lengths of 2x2x $\frac{1}{8}$  in. This was bolted to the back of the lathe bed and to the I beams. A 36 in. piece of 2x2x $\frac{1}{8}$  in. angle was bolted to the inside of the beams about 8 in. above the lathe bed with the end of the angle towards the tailstock, to carry the controls for the motor. The controls consisted of a push button starter and a reversing switch to give full control of the lathe from the normal working position in front of the machine.



The next unit, and the final one, was the motor and cone pulley mount. This was constructed from two pieces of  $1\frac{1}{2}$ x1- $1\frac{1}{4}$  in. channel iron 28 in. long to the rear of which a  $\frac{1}{4}$  in. 20x12 in. was bolted. Two bearings to carry the cone pulleys and the drive pulley (in our lathe a 12 in.  $\frac{5}{8}$  in. V pulley with a 2- $\frac{1}{2}$  in. motor pulley) gave a range of speeds suitable for the work. To the bottom of this unit, two  $1\frac{1}{2}$  in. solid iron bearings were bolted, so that with the unit in position over the lathe, the cone pulley was in line with the headstock cone. The motor is set back on the platform so that the weight of the motor affords sufficient tension to give positive drive to the headstock.

I have not given many dimensions as each job will vary depending on the make and type of lathe, and type and size of motor.

I believe this is timely as so many older machines are being put into service, and there is no doubt about the superiority of individual drive both for economy and efficiency.

## New MIDGET ARBOR PRESS

\$1500.  
DEL.



Here is the new MIDGET ARBOR PRESS for assembling operations. Also adapted for light metal and plastic cut-off.

This press has been designed with provisions for return spring and adjustable stop screw.

Because of its few parts it is unusually sturdy for its size and compactness. Every part has been machined accurately from special tooling, guaranteeing perfect performance.

### TABLE OF SPECIFICATIONS

3" clearance under spindle 2 x 1 1/4" size of pad  
1 1/4" clearance to column 1 13/16" length of stroke  
2 1/4" diameter of work 3/4" bearing each side

**MFR'D. BY TUNSTEAD MACHINE  
& TOOL COMPANY**

15 Standish Avenue, West Orange, N. J.  
DISTRIBUTED BY H. WILSON RYNO  
1360 Broad Street, Newark, New Jersey



## DOWEL & PINS



### Immediate Delivery!

Standard Size Dowel Pins from  
1/8" to 1" diameter and from  
3/8" to 6" length supplied in  
.0002 and .001 over basic sizes.  
Unless otherwise specified, .0002  
oversize will be furnished.

**SCHULTZ & ANDERSON CO.**

109 Edison Place, Newark 5, N. J.

## MARVECO LIVE CENTERS

- HIGH SPEED
- LONG LIFE
- HEAVY DUTY



MARVECO - guaranteed to outperform and outlast any other live center. Write for free catalog. "The Marvels of Marveco."

**SEND US  
YOUR CENTER PROBLEMS**

**MARVEL TOOL & MACHINE CO.**

3401 E. McNichols Road, Detroit 12, Mich.

## RIVETING with a

# GRANT



**assures  
you the  
utmost  
in  
RIVETING  
ECONOMY**



These GRANT Riveters are available in Noiseless Spinning and Vibrating Hammer types. Also Vertical and Horizontal Multiple Spindle Spinning Machines.

Information? Write!

**THE GRANT MFG.  
& MACHINE CO. C E Sta., Bridgeport 5, Conn.**

**LITTELL**

**AIR-BLAST  
VALVES**

**SAFER  
FASTER  
PRODUCTION**

LITTELL Air-Blast Valve automatically ejects pieces from punch presses. Keeps operator's hand out of danger zone. Increases safety and speed. Air nozzle quickly adjustable.

Other Littell safety devices include Pres-Vac Safety Feeders for picking up and feeding flat-surfaced materials; also, air-operated Mechanical Pickers for feeding pieces that vacuum lift will not pick up.

Littell makes a complete line of Automatic Reels, Feeds, Straighteners, **REQUEST BULLETINS** Scrap Cutters, etc.

**F. J. LITTELL MACHINE CO.**  
4153 Ravenswood Ave., Chicago 13, Ill.

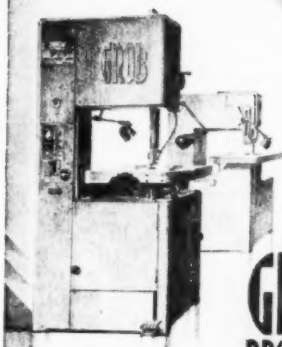
★ **THE  
WONDER  
CUTTER**

The lowest-priced wire and rod cutter on the market. The hardened cutters last indefinitely.

Hand operated. A giant for work, cuts wire and rods up to  $\frac{3}{8}$ -in. round or  $\frac{3}{8}$ -in. square and band iron up to  $\frac{1}{2}$  in. by 2-in. Adjustable stop for repeated cuts to same length. Large or small, your shop can use a WONDER CUTTER.

*Write today for prices.*

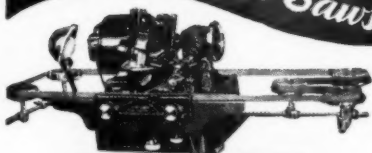
**THE FEDERAL FOUNDRY SUPPLY CO.**  
4602 East 71st St., Cleveland, Ohio

**SAWING****MAKING**

**GROB  
BROTHERS**

GRAFTON WISCONSIN

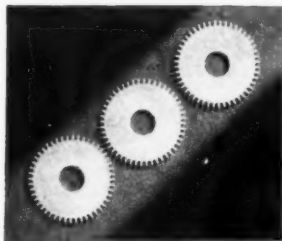
*Recondition Old Saws*



*With the* **HOWE LINDSEY  
AUTOMATIC  
SAW SHARPENER**

- HACK SAWS
- BAND SAWS
- CIRCULAR SAWS
- MEAT SAWS

**HOWE AND SON** Inc.  
HINSDALE N. H.



## 3 OF A KIND—

### Completely Interchangeable

Complete interchangeability is highly important today in units which operate continuously or for long periods under a variety of conditions. If breakdown should occur, a new part may easily be installed and operation resumed in short order.

Original gears for such units, and also replacements must have positive guaranteed accuracy, tooth form and finish, or the mechanism may fail. Our completely modern shop, equipment and methods, can serve you with assurance on such requirements. Write us for quotation on your specifications.

#### THREAD GRINDING

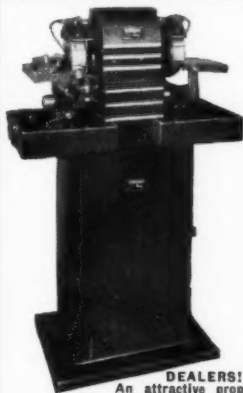
WORMS AND GEARS  
SMALL OR MEDIUM

SPUR, HELICAL, BEVEL,  
SPROCKETS & SPLINES



1033 PARMELE STREET

ROCKFORD, ILLINOIS



**DEALERS!**  
An attractive proposition open in certain territories.

## WILLEY'S MODEL 50-A CARBIDE TOOL GRINDER

Willey's new 50-A Grinder is compact and designed for the rapid, economical grinding of carbide tipped tools as well as other types of tool bits that require keenest cutting edges and extreme accuracy. It handles rough, semi-finish and finish grinding of tool bits having up to 2" square or equal cross section area. Bronze bearing trunnions support the tool rest table  $\frac{3}{4}$ " below work center, permitting grinding tools from  $\frac{3}{16}$ " to  $\frac{3}{4}$ " square without further horizontal movement—a Willey's feature that speeds production.

### WRITE FOR FOLDER

Complete specifications and illustrations of this new Willey's Grinder Model 50-A.

## WILLEY'S CARBIDE TOOL CO.

SOLE MAKERS OF WILLEY'S METAL

1342 W. Vernor Highway

Detroit 1, Michigan

### REINFORCE SMOKESTACK BY WELDING STEEL PLATES TO SHELL

As part of the modernization of the Canal Road central steam heating plant of the Cleveland Electric Illuminating Co. in Cleveland, a smokestack has been reinforced by welding steel plates to the steel shell from the foundation of the stack up to a 60-ft. height. The top part of the stack, which is 120 ft. high, was similarly reinforced several years ago.

The reinforcement of the stack by the welding process was determined by the company's engineers to be the most economical and efficient method of maintaining it.

The shell was covered with 1/4-inch steel

plate, cut and rolled so that four sections of plate would circumscribe the 7-ft., 6-in. diameter of the stack. The joints were bevelled 60° and the sections were welded together with "Fleetweld 5" shielded arc electrodes, each joint being made first with a stringer pass and then with a weaving bead.

The new exterior was then covered with red lead and black corrosion-resisting paint.

Mertz Company of Cleveland was in charge of the repair and used welding equipment furnished by The Lincoln Electric Co. of Cleveland.

### WELDING PETCOCK WRENCHES ON SIMPLE MACHINE SPEEDS PROCESS

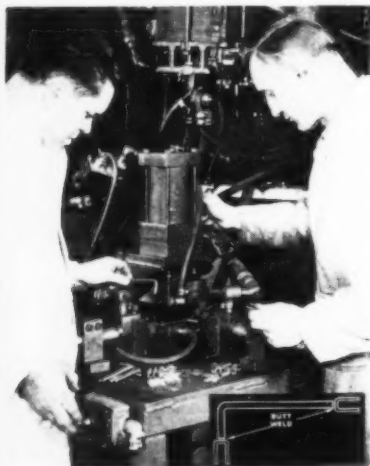
The flexibility with which resistance welding equipment can be adapted to specialized assembly problems in mass production is illustrated by a simple welding "machine" devised at Progressive Welder Co., Detroit, Mich., for assembling "universal" automotive radiator petcock wrenches. The machine was

pleted double end petcock wrenches per hour was obtained.

The wrench consists of 2 U-shaped mild steel stampings of different sizes, welded one to each end of a bent steel rod. Simple projection-welder type air-clamping dies hold the shank of the wrench. The two jaws are dropped over specially formed electrodes of two standard hydraulic push guns mounted in place. The guns move the petcock wrench jaws up to the shank under welding pressure to form the series butt weld.

Clamping pressure is applied by means of a standard Progressive air cylinder, controlled by an air valve mounted on the cylinder support where it is convenient to the operator. Balance of the equipment consists of standard 50 KVA portable gun welding transformer, a standard air-hydraulic booster to apply welding pressure, and simple weld timer, mounted on a nearby wall to control the welding cycle. Electrodes, dies, cables, and transformers are all water-cooled.

The arrangement lends itself to maximum operator comfort with high productivity, an operator standing or being seated in front of each of the two guns. The operator at the right (see cut) loads the wrench shank and one jaw, and works the air-clamp control. The operator at the left loads the other wrench jaw and initiates the welding cycle by pressing the palm switch, and unloads the completed wrench.



made up by converting standard portable spot welding gun equipment to a stationary butt welding "machine" by use of a special air clamping stationary fixture. With this a production of 150 com-

### FORD USES SOFT METAL AS DIE MATERIAL

A metal so soft that it melts in hot water has been put to work by Ford Motor Company research engineers as die material for making experimental parts.

The soft metal, an alloy of bismuth, tin

## DEEP-HOLE DRILLING

Send us prints of your parts requiring deep holes for an estimate on drilling only or furnishing parts complete.

We are especially equipped to drill deep holes from 3/16 to 1½ inch diameters up to 12 feet deep.

**CONNER**  
**TOOL & CUTTER COMPANY**  
(DEEP-DRILLING DIVISION)  
1000 East McNichols Road  
Detroit 3, Michigan

## BAUMBACH

THE DIE SET  
AUTHORITY



All Baumbach Die-Sets have demountable Leader Pins and Bushings. This exclusive feature permits removing Leader pins for machine work on the die shoe and assures reassembly without loss of alignment. A big time and trouble saver. Write for Catalog.

E. A. BAUMBACH MFG. CO.  
1810 S. KILBOURN AVE. CHICAGO 23, ILL.

## MADE OF ALLOY STEEL MILLED FROM BAR

SOCKET HEAD  
CAP SCREWS



SAFETY HOLLOW  
SET SCREWS

**Try Them On Your Next Job!**

**ECONOMY**  
**MACHINE PRODUCTS**  
**COMPANY**

5207 Lawrence Ave., Chicago 30, Ill.

*immediate delivery*

**ADAMAS**  
**CEMENTED**  
**CARBIDES**

FOR METAL CUTTING AND WEAR RESISTANCE

Standard and Special  
Shapes and Grades

**ADAMAS CARBIDE CORPORATION**

Producers of Cemented Carbides in All Forms

40-30 23rd STREET  
LONG ISLAND CITY 1, NEW YORK

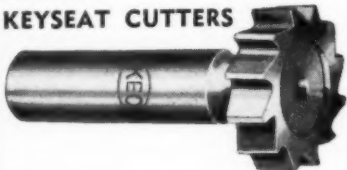
# KEO

## CENTER DRILLS



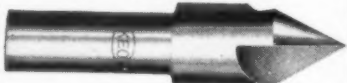
Made of finest high speed steel. Available in all standard sizes. Always in stock for immediate delivery. Specials made to your specifications.

## KEYSEAT CUTTERS



High speed. Right hand.  $\frac{1}{2}$ " shank. Diameters from  $\frac{1}{4}$ " to  $1\frac{1}{2}$ ". Standard sizes in stock for immediate delivery. Complete set—41 sizes—available in sturdy, hardwood box. Saves time and money, because you always have the size you need.

## CENTER REAMERS



High speed steel. Reamers from  $\frac{1}{4}$ " to 1" regularly furnished with 60°, 82°, 90° included angle. Specials made to your specifications.

## LATHE MANDRELS



Precision made of tool steel, hardened and accurately ground. Tapered .0005" to the inch. Mandrels from  $\frac{1}{8}$ " to 1" are .0005" undersize at small end, from  $1\frac{1}{2}$ " to 3", .001" undersize. Immediate delivery.

### Write for Literature

Illustrated literature and prices on all KEO Products mailed on request.

## KEO CUTTERS

19326 Woodward - Detroit 3 Mich.

and lead, ordinarily is too soft to stand the tremendous pressures imposed on dies.

Ford research engineers have overcome this obstacle by freezing the die in liquid nitrogen, one of the coldest substances known with a Fahrenheit temperature of 320 degrees below zero.

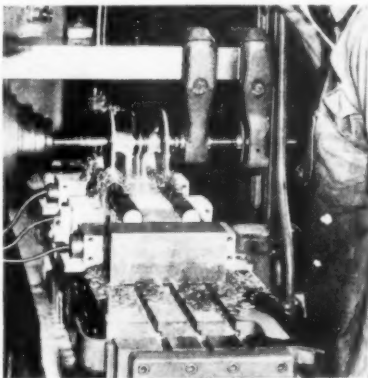
This freezing action intensifies the hardness of the surface from a consistency comparable to dried putty to the far greater hardness of ordinary brass.

From six to ten stampings can be secured between chillings in the frigid bath.

## MILLING KEYWAYS

The work shown here, done on a Sundstrand Automatic Rigidmill is milling keyways on steel 2" diameter x 25" long. Keyways 5" long x  $\frac{1}{2}$ " wide x .300 deep are milled in the center and at both ends, using 6" diam.,  $\frac{1}{2}$ " wide staggered tooth H.S.S. side mills. Feed rate is 7.13" per minute with rapid traverse at 300" per minute.

A significant feature of this operation is the use of magnetic chucks to hold



the workpieces. Three Power-Grip Viking Chucks, made by Rockford Magnetic Products Co., Inc., 1302-18th Ave., Rockford, Ill., with V-block fixtures are used. With end stop, as shown, the bars are held by these powerful chucks, requiring only a few seconds for loading and unloading. In this case, two bars are milled at a time, but as many as six bars can be milled with a similar set-up.

## "T" SURFACE GRINDER

NEW! PRECISION BALL BEARING SPINDLE

FOR PRECISION GRINDING —  
CAPACITY — 4" x 8" x 10"  
LEVER OPERATED, No gears or  
racks — Eliminates Backlash.  
BENCH OR FLOOR MODELS

WRITE FOR BULLETIN

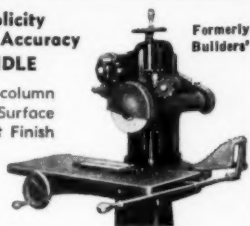
J. B. CROSMAN & SON

It's Simplicity  
Insures It's Accuracy  
NEW! PRECISION BALL BEARING SPINDLE

Spindle Pivots secured to column  
by '3 point' Bearing Surface  
No Vibration — Excellent Finish

'SOLD ALL OVER  
THE WORLD'

East Walpole, Mass.



Formerly  
Builders'

## BANDED THRUST BEARINGS



REGULAR  
OR  
SPECIAL DESIGN  
TO 24" O.D.

We also make Thrust Bearings inter-  
changeable with other manufacturers.

*We take in extra work on  
Blanchard Grinders.*

**ACORN BEARING CO.**  
66 Stanley St. New Britain, Conn.

## You need only one DORMAN TAPPER

... instead of three ordinary  
tappers ... to tap No. 2-56  
to 3/8" in steel or any other  
metal.

Here are three more advantages

1. No collets to get lost or need replacement.
2. Adjustable friction drive.
3. Can produce No. 3 or No. 4 fit.

The No. 2A tapper drives  
from 3/8" to 7/8" and No 3-A  
drives from 1/2" to 1 1/4" in  
any tapable material.

Price No. 1 Size \$44.00 with M.  
T. Shank or \$50.00 with Adapter  
for Male Spindle Drill Press.  
Round Split, Button or Acorn Die  
Holder Assemblies in stock for all  
size Dorman Tappers permitting  
their use for external threading.

Write for Die Holder Bulletin



**Dorman Machine Tool Works**  
40 S. MAC QUESTEN PKWY.  
MOUNT VERNON, NEW YORK

## ILLUMINATED INSPECTION

## BORESCOPIES



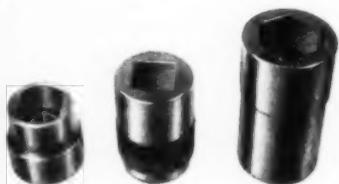
"Lenox Detects Hidden Defects" while ex-  
ploring the dark holes of industry — guns,  
hollow shafts — Refinery, well drill and other  
tubing, irregular dark spaces.

American Pioneers—Twenty-  
three years. Give diam-  
eter, length and shape of  
cavity.

**LENOX INSTRUMENT COMPANY**

2008 CHANCELLOR ST.  
PHILADELPHIA 3, PA.

## TOSCO SPECIAL WRENCHES MADE TO ORDER



**Wrenches — Adaptors  
Drivers — Sockets**

**TOOL SUPPLY CO.**  
40 CUSTER AVE.  
DETROIT 2, MICH.

## Brass and Aluminum HAMMERS

heads — sand mold casting  
handles—13" to 14"—AR grade Hickory

### BRASS Hammers

good grade yellow brass

16 oz. ....	\$10.80 per dozen
24 oz. ....	14.40 per dozen
32 oz. ....	16.80 per dozen

### ALUMINUM Hammers

5½ oz. ....	\$7.80 per dozen
8 oz. ....	9.60 per dozen
10½ oz. ....	10.80 per dozen

Let us give you our prices on your Aluminum, Brass or Bronze castings. Jobbers: Send for our Machinist Hammer Catalog pages and discounts.

## KLOPPENBORG ALUMINUM FOUNDRY

211 Marquette St., Dept. MT117,  
Davenport, Iowa

## IMPROVED SOLDERLESS WIRE CONNECTORS

The Solar Electric Corp. announces an improvement in their line of hot molded bakelite solderless wire connectors designed for quick and easy joining of standard gauge electric wires.

The newly improved connectors, distributed under the trade name "Scru-its" are manufactured in several sizes for connecting various combinations of solid and stranded wires.

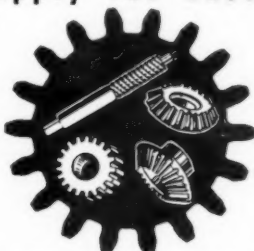
"Scru-its" are not affected by heat, cold or moisture, and are used for permanent wire connections, as well as for "roughing-in" work, without tape, solder, heat or special tools. They are easy to use, safe and inexpensive. All sizes carry the UL Label of approval.

Wire ends are stripped, and the "Scru-its" screw right on. No twisting of wires is necessary. Their compact size permits their use in switch boxes, fixtures, fuse boxes, appliances, and many other applications.

Complete data is available by writing to Sales Dept., Solar Electric Corp., Warren, Pa., requesting Bulletin No. 146-G.

**Have you a gear problem?**

Let *Abart*  
supply the answer



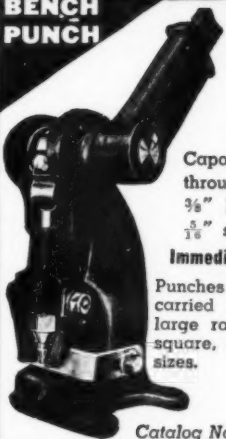
Long specialized gear experience, and every facility for most modern precision cutting. No stocks. Every ABART job a special job. Send samples or B/P for prompt estimate, any quantity.

## ABART GEAR & MACHINE CO.

4832 W. 16th St., Chicago 50, Ill.

Also Abart Speed Reducers. Ask for catalog

## FRONT LEVER BENCH PUNCH



**STURDY  
•  
DURABLE  
•  
HANDY**

Capacity:  $\frac{1}{8}$ " hole  
through  $\frac{1}{4}$ " steel or  
 $\frac{3}{8}$ " hole through  
 $\frac{5}{8}$ " steel.

**Immediate shipment.**

Punches and dies are  
carried in stock in a  
large range of round,  
square, flat, and oval  
sizes.

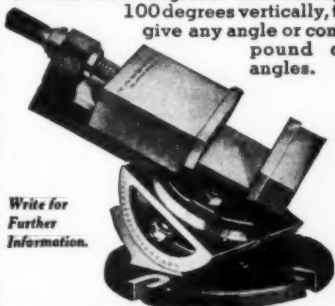
*Catalog No. 8 available*

**T. H. LEWTHWAITE MACHINE CO.**  
311 East 47th St. New York 17, N. Y.

## New Britain UNIVERSAL VISE

**THE ORIGINAL**

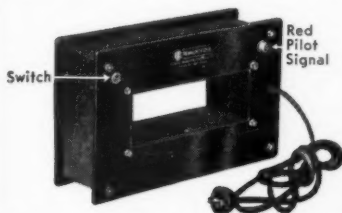
Swivels 360 degrees horizontally,  
100 degrees vertically, to  
give any angle or com-  
pound of  
angles.



*Write for  
Further  
Information.*

**NEW BRITAIN TOOL & MFG. CO.**  
NEW BRITAIN, CONN., U. S. A.

## AMC *Quick* DEMAGNETIZER



A necessity where machine tools are  
used.

Standard units available and special  
sizes to order.

*Write today for descriptive circular.*

**ALOFS MFG. CO.**  
1629 Madison Grand Rapids, Mich.

## NIELSEN Heavy Duty *Live Centers*



*Write for  
catalog on  
live centers*

Adapted  
for heavy  
duty work.  
Precision type  
ball and roller  
bearings assure  
maximum capac-  
ity for high speed  
production and long  
service.

**NIELSEN, INC.** LAWTON, MICH.



# ACE

## DRILL JIG BUSHINGS

A.S.A. STANDARD  
Immediate Delivery  
on standard sizes  
Fast service on specials

(Write for Catalog and Discount Sheet)

**WEST COAST AERO TOOL CO.**

5401 Fountain Ave., Los Angeles 27, Calif.

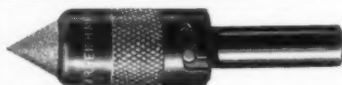


# CUB

## VARIABLE SPEED TRANSMISSION

For "A" section V-belts—3.3—1 speed range—perfect belt alignment in all positions. Priced so low that no shop or machine need go without infinite speed selection. See your dealer or write (3 Types—8 sizes to choose from) **\$16.50**

**Standard Transmission Equipment Co.**  
3409 VERDUGO ROAD LOS ANGELES, CALIF.



## ABRASIVE CENT-R-LAP TOOL

Saves time, eliminates diamond dressing. Cones changed in seconds. Available in 2 sizes  $\frac{3}{8}$ " and  $\frac{1}{2}$ " Cent-R-Laps and abrasive Cones.

Write for descriptive literature and prices.

**J. R. Reich Manufacturing Co.**  
45 E. Stroop Rd. Dayton 9, Ohio

# PYRO THE SIMPLIFIED OPTICAL PYROMETER



Unique construction enables operators to rapidly determine temperature even on minute spots, fast moving objects or the smallest streams; no correction charts, no accessories, no upkeep.

**THE PYROMETER INSTRUMENT CO.**  
102-105 Lafayette St., New York, N. Y.

# CARROLL DIVIDING HEADS



Catalog on Request

3 SIZES - 4 MODELS - 6" to 12"

**TROYKE MFG. CO.**

4422 APPLETON ST. CINCINNATI 9, O.



# ATLANTIC for GEARS

Our service on small gears, due to new equipment recently installed, will interest you.

Send samples or blueprints for quotation.

**ATLANTIC GEAR WORKS, INC.**  
192 Lafayette St., N. Y. 12, N. Y. CAnal 4-1441

If you use **COOLANTS**  
**INVESTIGATE**  
The New Coolant Additive

# METOL CORP.

8 S. Michigan Ave., Chicago 3, Ill.

**Severance** HIGH SPEED  
CARBIDE CHATTERLESS COUNTERSINKS

- Shear cutting action
- Speedy—for air-tested seats
- Materials—up to 63-C hardness

17 stock sizes up to 2" diameter  
30° 41° 45° and 60° angles with C/L  
Shanks—plain, tang drive, tapers

**ENGINEERING SERVICE**  
Write for Bulletin 15-C

**SEVERANCE TOOL INDUSTRIES, Inc.**  
722 Iowa Ave., Saginaw, Michigan

# ERRINGTON MECHANICAL LABORATORY

MAIN OFFICE AND WORKS: STATEN ISLAND 4, NEW YORK

Chicago Office:  
6701 N. SIOUX AVENUE

New York Office  
170 BROADWAY

## CLUTCH OR CONE DRIVE

*Our High Speed Tappers  
are Super-Sensitive for  
Small Tapping*



*All  
Styles  
and  
Sizes—  
0 to 2"  
Taps*

*Style B  
Positive  
Adjustable  
stop holds  
work down*

*Style C Graduated  
Adjustable Safety  
Friction*

*Style D-E, Quick Change Tools*

## Motorized HOPPER UNITS

*Speedy  
Sturdy  
Dependable*

### FASTEST FEED • STURDY WIDELY ADAPTABLE

For use with Presses, Centerless Grinders,  
Thread Rolling and Slotting Machines, or any  
special machine.

### SUCCESSFULLY FEED:

SCREWS, SCREW BLANKS, RIVETS, PINS, DISCS,  
NUTS, BEARING ROLLERS, STEEL BALLS, WASHERS  
AND SPECIAL PARTS ADAPTABLE TO HOPPER.

*Send Samples for Detailed Information*



**DETROIT POWER SCREWDRIVER CO.**

2809 W. Fort Street  
Detroit 6, Michigan

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

319

### Accurate Hole Transfer Made Easy With NIELSEN TRANSFER SCREWS



Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods. 7 sizes U.S.S.—Inexpensive—last for years.

Write for Circular  
**NIELSEN TOOL &  
DIE COMPANY**  
1962 W. Eleven Mile Road,  
Berkley, Mich.



## New NESTING TYPE TOTE PANS

20" Long x 12"  
Wide x 6 1/4" Deep  
16 Ga., drag holes,  
handles both ends.

**J. L. LUCAS & SON, INC.**  
BRIDGEPORT 5. CONN.

### High Speed Cutting Tools

- Special high speed circular, dovetail, flat form and special tool bits.
- Design and manufacture of small machines, jigs, gages and experimental parts.
- Regrinding and salvaging high speed flat form, special bits and small flat broaches.

DELIVERY AS REQUIRED  
WRITE FOR QUOTES

Attractive Proposition for Representatives

**Lincoln Park Manufacturing Co.**  
3302 Dix Road Lincoln Park, Mich.

### STANDARD PARTS



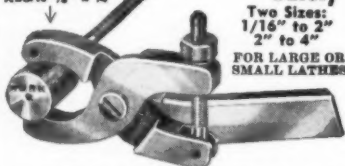
FOR  
JIGS, FIXTURES,  
DIES, GAGES, TOOLS  
AND MACHINERY

Featuring  
Hand Knobs, Quar-  
ter Turn Screws,  
Spherical Washers,  
"C" Washers, Jig  
Feet - Locating Keys  
Write for Catalog No. 2  
Inquiries for Tool Die  
and Mold Estimates  
Invited

GEORGE J. BUB AND SON  
11413 MADISON AVE CLEVELAND 2, OHIO

### KNURL it Easily, Quickly, Safely

Use any Standard  
Knurl 1/8" x 1/8"



Two Sizes:  
1/16" to 2"  
2" to 4"

FOR LARGE OR  
SMALL LATHES

Joseph B. Fakes & Co., Royal Oak, Mich.

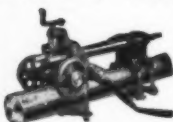
## CAMS

Our ROWBOTTOM cam cutting facilities are at your disposal for your cam requirements.

Let us have your inquiries.

**BLOOMFIELD TOOL CORP.**  
36 Farrand St. Bloomfield, N. J.

### BURR KEYSEATERS



Mill keyways in the run or on the ends of shafting already erected—save money on alteration, erection, and repair work.

Made in 4 sizes, for hand or motor operation.

Write for Bulletins and prices.

**JOHN T. BURR & SON**  
429 Kent Ave., Brooklyn, N. Y.

## BEVEL GEARS

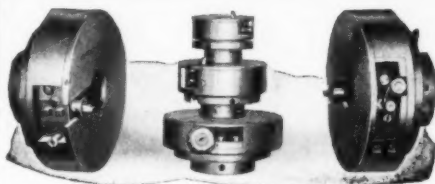
PROMPT DELIVERY

UP TO 12" DIAM. - 3 D. P.  
CUTTING ONLY or COMPLETE GEARS  
LATEST GLEASON EQUIPMENT



*Greaves* MACHINE TOOL CO.  
8G 2013 Eastern Ave.  
Cincinnati, Ohio





## MUMMERT-DIXON FACING HEADS with Automatic Feed

One-way Tool Feed — 6, 9 and 12" sizes.

Two-way Tool Feed — 9, 12, 16, 20, 24, 30, 36, 40 and 46" sizes.

Save many costly set-ups.

Bulletin No. 4141 Gives Full Details

**MUMMERT-DIXON CO., 122 Philadelphia St., Hanover, Pa.**

## ROLL FORMING MACHINES AND ROLLER DIES

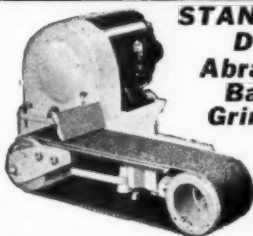


Also Pittsburgh Lock Machines, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery—

Your inquiries invited.

**Maplewood Machinery Co.**

2634 Fullerton Ave. Chicago, Illinois



## STANDARD D-4 Abrasive Band Grinder

Famous  
for  
Stamina

This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre . . . at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood 4x36 1/4" band. The ideal portable unit.

OTHER STYLES AND SIZES IN NEW  
MANUAL ON FINISHING—WRITE TODAY

**WALLS SALES CORP.**

306 E. 38th St., New York 16, N. Y.

## *We Service all Makes*

- Micrometers
- Verniers
- Gear Tooth Verniers
- Adj. Snap Gauges
- Levels
- Cubes
- Indicators
- Height Gauges
- Squares
- Bevel Protractors
- Surface Plates
- Carbonyl Tipping

**USING STANDARD PARTS  
...10 DAY SERVICE...**

## DIXON and RYAN CO.

Precision Tool Service

309 S. TROY ST.  
ROYAL OAK, MICH.

PHONE  
R. O. 1772

EST.  
1926



# NOW AVAILABLE

At leading distributors in sizes from 2" to 6", threaded to mount directly on the spindles of popular make metal and woodworking lathes.

*Dexter*



## UNIVERSAL LATHE CHUCKS

A 3-Jaw Self-Centering Chuck with lever operated scroll. Quality workmanship is inherent in the flawless accuracy of the scroll and jaws and the high lustrous finish of the face and scroll, the two main parts each produced from high-tensile alloy castings.

Write Dept. D for details — also Dexter Valve Resealing Equipment and Dexter Air Separators.

C-72

### THE LEAVITT MACHINE COMPANY ORANGE, MASSACHUSETTS

#### AMERICAN FAIR TRADE COUNCIL FIGHTS CAMPAIGN TO DESTROY FAIR TRADES

The American Fair Trade Council has filed a report with the Joint Congressional Committee on the Economic Report in defense against what the Council contends is a retail campaign to destroy Fair Trade and expose consumers to quality deteriorations. The Council sampled 21 industries to determine reactions to inflationary pressures of Fair-Traded products over the period April 1, 1946 to May 15, 1947.

Of 1,235 Fair Trade retail prices re-

ports of Fair Trade pricing could not be seen of Fair Trade. "A close examination of such unfair pricing... will disclose to your Committee... that the same pricing methods could be and are followed on products not under Fair Trade..."

"It is respectfully suggested that your Committee has before it an unusual opportunity for public service by determining and publicizing skilfully obscured facts about Fair Trade and its sound contributions to public welfare and to the stability of our national economy."

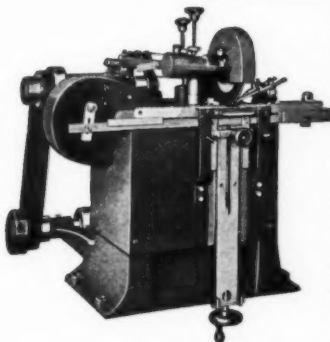
ported, only 356 showed any increase, average of which was 23.0%. An average decrease of 21.3% was shown by 116 of the Fair Trade prices reported. 763 were unchanged.

In answer to charges that certain manufacturers of Fair-Traded products had encouraged extortionate pricing by retailers, the Council contends that Fair Trade retail price becomes too familiar to retailers and the public for retailers to charge more than the Fair Trade price. Further, if all qualified branded products had been held under Fair Trade by manufacturers during the past ten years, inflationary trends would have been minimized.

The Council further contends that there may be some Fair-Trade manufacturers willing to resort to deceptive methods but identical practices could be more readily practiced on products not under Fair Trade. Also that opponents say that irregular pricing is present in the absence of Fair Trade.

---

**More Metal cut per dollar**  
**...when blade is sharpened with E.C.**



Properly sharpened metal cutting saws last longer. In fact E.C. Combination Metal Cutting Circular, Hack and Band Saw Grinder has demonstrated it can pay for itself within a year by the savings on blades alone.

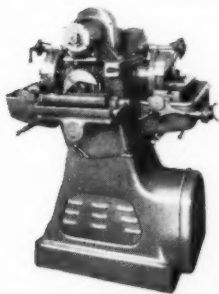
Blades not only last longer, but cut cleaner and faster with minimum destructive effect on teeth. Write for Bulletin E.C.

---

**THE WARDWELL MANUFACTURING CO.**  
3165 Fulton Road, Cleveland 9, Ohio

---

**HOW TO GRIND CARBIDE CUTTING  
TOOL BITS ECONOMICALLY**



**Here's tool grinding at its best!**

Employing 3-step progression—rough, semi-finish, and finish or hone—on one machine, this LeMaire 3-Wheel Grinder produces keener edge in fraction of time. Because tools go to diamond wheels in better condition, life of diamond wheels is considerably lengthened. Both labor and wheel costs are reduced—time is saved—production is increased.

Wouldn't you like to know more about this remarkable 3-Wheel Grinder? Send for descriptive folder.

---

**LeMaire Tool & Mfg. Co.** 2637 S. Telegraph Road  
Dearborn, Michigan

---

*Designers and builders of unit and way type machines for single or multiple spindle drilling, boring, reaming, tapping, etc.—Twin Ram Hydraulic Units—Match-It Gear Chucks.*

# BIG MOTOR MANUFACTURER

## JUMPS PRODUCTION

using

### ERICKSON

#### Precision Expanding Mandrel



Using special Erickson face plate mandrel, drawbar type, with locators and positive drive pins, manufacturer turns outside

diameter of motor stators and straddle faces; jumps production to 200 pieces per hour; preserves concentricity within very narrow tolerances. You'll probably be amazed at the almost countless applications to which Erickson Precision Expanding Mandrels can be adapted. Uniform vise-like grip throughout expansion range of  $\frac{1}{2}$ " , guaranteed accuracy of .0005".

Ask for Catalog T-12 or Erickson engineer

**ERICKSON TOOLS DIVISION**  
2310 Hamilton Ave., Cleveland 14, Ohio



# ERICKSON = Collet Chuck Precision

### AIR EXPRESS HAS CARRIED VARIETY OF COMMODITIES

Stranger than fiction itself are the commodities that have sprouted wings since four pioneering air carriers, vanguard of today's vast domestic certificated airlines' network, launched scheduled air express service on September 1, 1927.

Airborne cargo has been the answer to SOS calls for supplies during time of catastrophe, such as the Texas City explosion, as well as for gayer periods including weddings and celebrations.

compartments of scheduled craft in tremendous numbers.

The first airborne shipment on record was the shipment of five bolts of silk weighing 60 pounds flown as a stunt to Columbus, Ohio, on November 7, 1910. A passenger seated precariously on the leading edge of the lower wing of a Wright biplane, carried the material on his knees. The silk was used to make ties.

Today, air express transports more goods in a single day than it handled throughout 1932.

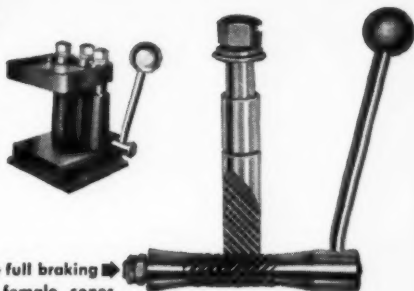
Incubators from Cleveland, Ohio saved the lives of two of a set of triplets born a few hours earlier in Kansas City. A shipment of South American toads nipped a parasitic invasion of Florida's sugar cane fields.

There were also the black widow spiders, Australian spiny anteater, gizzardless hen, 2800 year old mummy, leeches, stone crabs, false teeth, pet pelican, bees porpoise milk, broken-in shoes, streptomycin, and other curiosities that rode the 120,000 miles of certificated airways.

Throughout the war the major portion of air cargo was heavy machinery and spare parts, highly perishable drugs and foodstuff and other commodities rating priority. Today, regular industrial and commercial materials are going by air in ever-increasing quantities and numerous personal shipments are finding their way into the cargo

## "CONE-LOK" JIGS

- MECHANICAL SIMPLICITY
- ADAPTABILITY
- RUGGED CONSTRUCTION
- CHIP PROTECTION
- SEALED LUBRICANT
- MAXIMUM SAFETY



The Woodworth "CONE-LOK" jig utilizes the full braking power of its perfectly mated male and female cones.

**ACCURACY  
YOU CAN TRUST**

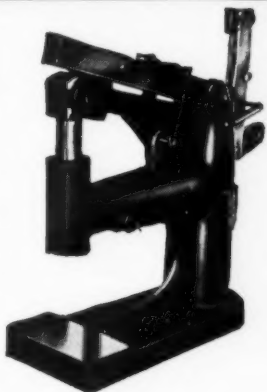
★ CATALOG AND FULL SCALE TEMPLATES UPON REQUEST ★

# WOODWORTH

N. A. WOODWORTH CO., SALES DIVISION • 1300 E. NINE MILE RD., DETROIT 20, MICH.

## Unskilled labor does PRECISION RIVETING

With a Weber Automatic Staking Machine, unskilled operators turn out more kinds of jobs faster and more accurately than any other method. Simple adjustment delivers the right hammer blow for each job whether staking fixed or movable joints. Write for folder.



	Model 1	Model 1-B	Model 2
Stroke	2"	2"	2½"
Spindle	1"	1"	1¼"
Throat Spindle	4¾"	4¾"	8¼"

## WEBER Machine Corp.

59 RUTTER STREET • ROCHESTER 6, NEW YORK

### DISTRIBUTORS

Some territories are still open, offering substantial profit possibilities. Write regarding yours.

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

## *Gits Engineers Did It Again!*

Manufacturer states,  
"Re-lubrication  
now a matter  
of seconds"

with

### **GITS** **BALL VALVE** **OILERS**



Precise Products Co., Racine, Wis., acclaims the GITS Ball Valve Oiler, writing: "These efficient self-sealing oilers have facilitated the re-lubrication of our 40,000 RPM electric handtools to such an extent that the failure of ball bearings has been reduced to a negligible number. In our former model . . . handtool this operation required more than fifteen minutes of a skilled mechanic's time."

In hundreds of cases like this, manufacturers have discarded the old "hole-in-the-housing" which freely admitted grit and dirt—specifying self-sealing GITS oilers for complete and permanent bearing protection.

Write for  
172-page  
catalog

## **GITS BROS. MFG. CO.**

1860 S. Kilbourn Ave., Chicago 23, Illinois

*Exclusive for over 40 years*

### **MANAGEMENT SOCIETY PRESENTS HUMAN RELATIONS AWARD**

Charles P. McCormick, Chairman and President of McCormick & Company, Inc., Baltimore, Maryland, is recipient of the "Human Relations Award" presented by the Society for the Advancement of Management for outstanding performance in the development of human relations in industry in the year 1946.

The citation presented to Mr. McCormick read as follows:

"Because you have developed in your own company a method of taking your

supervisory forces into your confidence and making them in fact a part of Management, thereby creating a feeling of understanding and co-operation throughout your entire organization;

"Because you have reduced your method to a practical working formula, which you call Multiple Management, and thus made its benefits available to other companies;

"And because you have been untiring in your efforts to spread both here and abroad the philosophy that the safeguarding of the dignity of man is the key to the successful operation of any business;

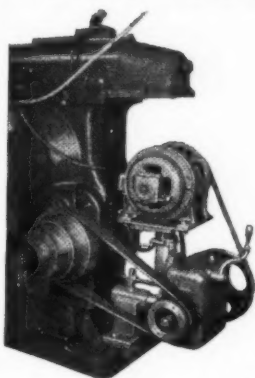
"The Society for the Advancement of Management hereby presents you with its 1946 award for your contribution to the promotion of human relations in the field of industry and business."

The award was presented at a dinner meeting, concluding the conference, at which Dr.

George S. Benson, President of Harding College, was the principal speaker, and at which W. L. McGrath, President of The Williamson Heater Co. presided as National President of The Society for the Advancement of Management.

Among other speakers were Eugene B. Mapel, Carnegie-Illinois Steel Corp., Pittsburgh; H. C. Blankmeyer, Joseph E. Seagram & Sons, Inc., Louisville, Ky.; Fred Smith, General Shoe Corp., Nashville, Tennessee; Dr. F. G. Barr, Industrial Relations, The National Cash Register Company, Dayton, Ohio.

## BERKELEY POWER DRIVE



**For over twenty years the drive to better and greater production.**

Constructed with either a three or four speed selective sliding gear transmission, this drive is individually designed and built for your specific needs. Transmission handle is readily accessible . . . gears operate in a sealed housing to prevent loss of oil or entrance of foreign substances. Drive is direct on high speed . . . no power is transmitted through the gears. Write today for full particulars and informative 8 page folder and learn how **BERKELEY POWER DRIVES** can speed up production in your plant.

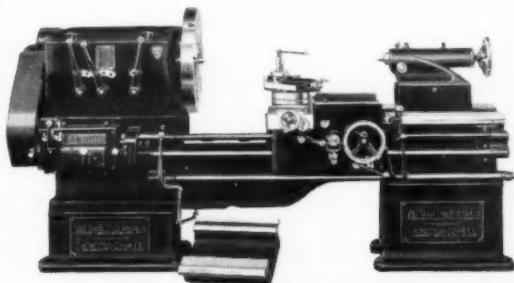
Drives are also available for every type of machine tool and special units.

*Manufactured exclusively by*

**THE DANVILLE TOOL CORPORATION**  
**DANVILLE, ILLINOIS**

## NEBEL Removable Block Gap Lathes

Geared Head Motor Driven Type, 3 Step Cone Double Back Gear Belt Driven Type or with Motorized Headstock. Especially adapted for repair and maintenance as well as for general manufacturing. Handle a large variety of work with large swing through the gap.



All Geared headstock type completely equipped with Timken Bearings, with motor mounted on rear of lathe. Quick change gear box, compound rest, steady rest, chasing dial, face plate, driver plate, wrenches, tool post and centers.

Furnished in four different sizes as follows:  
Series "LN" 18/27",  
Series "AA" 20/30",  
Series "B" 22/33, and  
Series "D" 25/40".

**Write for Circular Giving Complete Information**

**THE NEBEL MACHINE TOOL COMPANY**  
**CINCINNATI 25, OHIO**



**SPEEDY ACCURATE MILLING**

*Saves Labor!*

On countless jobs—Kent-Owens Milling Machines have shown ability to turn out work with top speed and high accuracy. They're rugged... efficient. Designed to help you produce more... with lower costs! Write for bulletin. Kent-Owens Machine Co., Toledo, Ohio.

No. 2-20 Milling Machine—Table, 42" x 12"  
Table travel, 20".

# KENT-OWENS

## *Milling Machines*

### J. G. MAGRATH BECOMES EXECUTIVE SECRETARY OF AMERICAN WELDING SOCIETY

At their meeting on July 11, 1947, the Board of Directors, American Welding Society, unanimously selected Joseph Gordon Magrath for the new position of Executive Secretary of the Society, the duties of which he assumed on September 2, 1947. As the chief staff officer of the Society, Mr. Magrath will work with other members of the National Headquarters staff in directing the activities of this national engineering organization of about 7,500 members.

executives and engineering society groups.

Mr. Magrath was associated directly with welded product design as far back as 1917, first with the Budd Wheel Manufacturing Company on the fabrication of wheel structures for the first World War "quads" (original four-wheel drive ordnance vehicles); then in 1922 and '23 on welded steel sash, doors and plate fabrication for the David Lupton Sons Co. During the recent war he was active in the exploration of flame-treatment processing of welded fabrication in many of the larger shipyards.

Mr. Magrath was born in Philadelphia on July 28, 1899. He is a Registered Engineer of the State of Illinois, and is a member of the American Society for Metals, Society of American Military Engineers, and the Steam Specialties Club, New York. Just before joining the staff of the A. W. S., Mr. Magrath was Sales Manager of the McAlair Manufacturing Division of Climax Industries, Inc.

From 1934 to 1944, Mr. Magrath was associated with the Air Reduction Sales Company, where he supervised market, process and product demand surveys and promotion sales activities through sales and service engineering staff of 26 district offices. He collaborated with displays, conventions and technical society activities. He was concerned with sales-service instruction and promotion meetings, and gave numerous talks before industrial



**Brand New!  
NO-STOP SPINDLE**

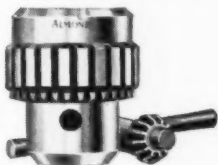
It's unique! It's a time saver! It's practical! It's precision built! This amazing NO-STOP SPINDLE is a boon to many shops, such as plating, metal finishing, stamping, emblem shops and small parts manufacturers.

WE ARE SOLICITING FOR  
DISTRIBUTORS

**LOUIS C. RATHBUN CO.**

18 S. FREDERICK AVE., OELWEIN, IOWA

## ALMOND DRILL CHUCKS



Maximum gripping power with  
extreme accuracy and long life.

*Write for Catalog*

**T. R. ALMOND MFG. CO.**  
ASHBURNHAM, MASS.  
U. S. A.

*Here's Why Machine Tool Builders Prefer*

## VIMCOLIGHT

**DIRECT  
LIGHTING**

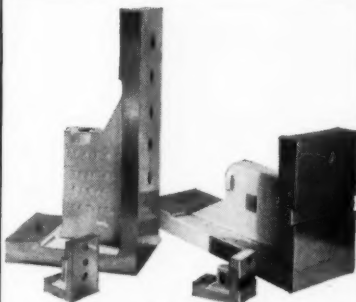
**E A S Y  
TO INSTALL  
NO MAINTENANCE  
RUGGED CONSTRUCTION  
SPECIAL OIL-PROOF CORD  
BALL SWIVEL JOINT WITH  
EASILY ADJUSTED FLEXIBLE ARM**

*Standard and Special Types  
to Meet all Direct Lighting  
Requirements of Machine  
Tool Builders.*

*Write for Folder 74*

**VIMCO MFG. COMPANY, Inc.**

109 Brayton St., Buffalo 13, N. Y.



Patented

World's Best: Surface, Lapping, Angle  
Plates, Straight Edges, Box and Steel  
Parallels, semi-steel plates and special  
products. Until further notice write

**TATRA TOOL CO.**

Box B-62

c/o HITCHCOCK PUBLISHING COMPANY  
542 S. Dearborn St. Chicago 5, ILL.

# SIGOURNEY M-100

## MAINTAINED ACCURACY

### N PRECISION WORK

The Sigourney M-100 Bench Drilling Machine is extremely accurate on precision jobs. It is unusually sturdy and rigid in construction . . . has hardened and ground spindles . . . and sealed ball bearings throughout. All moving parts are entirely closed for maximum operator safety.

A-100 is built for long and steady service.

This sturdily constructed bench drilling machine is available in 1, 2, 3 and 4 spindle models . . . speeds from 4,000 to 9,000 r.p.m.

*Send for illustrated bulletin*

**THE SIGOURNEY TOOL CO.**  
Hartford 6, Conn.

*Sole Sales Agents*

# PRATT & WHITNEY

Division Niles - Bement - Pond Co.

West Hartford, Connecticut

### STUDY PRESENTED OF GERMAN METHODS OF EXTRACTING SOYBEAN OILS

German manufacturers' claim that their soybean oil retains its flavor stability and is not subject to "reversion" under normal storage conditions for long periods merit the attention of the American fat and oil industry, according to Warren H. Goss, author of a comprehensive survey of the German oilseed industry, published by the Hobart Publishing Co., Washington 15, D. C.

Dr. Goss made a study of the oilseed industry in Germany shortly after the

war ended,, under the sponsorship of the U. S. Department of Commerce.

That the Germans have solved the problem of reversion in soybean oil could not be determined conclusively, Dr. Goss states. It was impossible to obtain samples since soybeans were not available during the war in Germany, and some of the information volunteered by German technicians conflicted. However, enough convincing data was obtained to warrant careful study by American manufacturers.

Not only in soybean processing, but in practically all respects the German oilseed industry veers sharply from American practices, Dr. Goss says. This is chiefly due, he believes, to different uses of oilseed products in Germany. Vegetable shortening, so widely used in the U. S., is a minor product in Germany. The German housewife depends on margarine as her all-purpose fat for frying, baking, as a spread, etc.

Dr. Goss states that while American oilseed technology appears vastly superior to the German, a strict comparison is hardly justified, since consumer markets and needs are so different in the two countries. Nearly all American refining is continuous, while the Germans prefer the batch method. Again, hydrogenation in Germany is used to obtain a high proportion of isoolic acid for use in margarine—just the opposite of hydrogenation in the U. S.



## NEW SIMPLE ACCURATE *Save time* WITH THE CENTER MASTER *Gage*

Meet today's precision production needs.

No skill needed—simply hold the work on the gage pin as shown in the illustration. Read the diameter of the center hole directly on the indicator.

Makes obsolete the old clumsy ways of checking diameters of centers.

CENTER MASTER has been designed to fit a long felt need. It provides the only practical method of actually measuring the diameters of center holes with extreme accuracy. No time-consuming set up and calculation.

By the use of a simple leverage principle the CENTER MASTER gives the actual diameter of the center holes. Direct indicator reading . . . no guessing . . . no calculations involved.

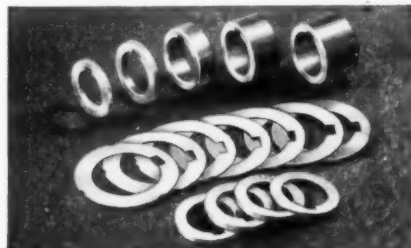
### VETERAN MACHINE WORKS

511 S. Laflin St.

Chicago 7, Ill.

## PACKAGED PRECISION

MACHINISTS HAVE LEARNED TO RELY ON DE-STA-CO Arbor Spacers and Shims for milling, slitting, gang-saw set-ups and for shimmiing gears and bearings. De-Sta-Co long-life steel Spacers are packaged in a standard range of sizes from  $\frac{3}{8}$ " to 4" hole diameter, up to  $5\frac{1}{2}$ " outside, thicknesses from .001" to .125", all *with keyway*. Shims are stamped and coined to commercial tolerances in the same preferred sizes, *without keyway*.



Special spacers—thicknesses greater than .125"—are also available in popular sizes, machined from bar stock, hardened and ground, with standard keyways and thickness identifications.

Handy spacer kits of 19 graduated decimal thicknesses are stocked by Mill Supply Dealers in principal industrial centers. *Order your Packaged Precision Today.*

Your De-Sta-Co Toggle Clamp Catalog No. 47 is waiting for you. *Send for it!*

### DETROIT STAMPING COMPANY

347 Midland Ave.

Detroit 3, Mich.

# Speed Up GRINDING JOBS

With Automatic  
DIAMETER INSPECTING  
GAUGE



Pratt Grinding Gauges caliper external cylindrical jobs while work is in motion or at rest. Adapted to straight or tapered work. Tolerances of .0001" plus or minus easily maintained. Visible check on out of roundness, rough grinding and chatter. Cannot grind work undersize unknowingly. Easily installed on any grinder. Pratt Grinding Gauges increase production, eliminate scrap and assure accuracy. A modern precision tool, ruggedly built.

**American**

**DIAMOND TOOL & GAUGE CO.**

15920 WOODINGHAM • DETROIT 21, MICH.

Send for Bulletin

## NATIONAL MATERIALS HANDLING EXPOSITION TO COVER 200,000 SQUARE FEET

The National Materials Handling Exposition will be conducted for the second year in the Public Auditorium, Cleveland, O., Jan. 12-16, inclusive, it was announced by Edwin J. Heimer, president of Barrett-Cravens Co., Chicago, and chairman of the exposition committee.

The exposition, which attracted more than 12,000 top management executives last January, will occupy almost 200,000 square feet of exhibit space, nearly three times the previous area, and thus will

rank among the top fifteen national industrial expositions, Heimer said.

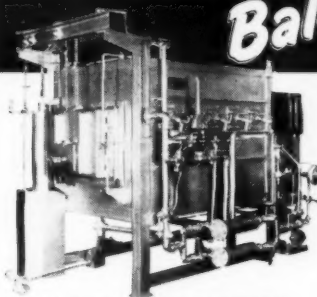
The show will run for five days and all systems of materials handling will be on exhibition. Educational features will include a Conference on Materials Handling, which will be held concurrently with the exposition; a Materials Handling Theatre which will present films on handling subjects, and an institutional presentation of materials handling equipment and systems in addition to those shown in the commercial exhibits.

Virtually all booths will be larger in area to permit demonstration of equipment in motion. Increases range from two to five times previous areas used. To accommodate the larger booth dimensions, the exposition has been moved to the Lake-side exposition halls of the Auditorium.

"Recent surveys have indicated,"

said Heimer, "that the handling of materials, a completely non-productive operation, constitutes from twelve to as much as fifty per cent of total labor costs in various industries. The over-all national average has been placed in the neighborhood of twenty-two per cent of all labor costs.

"If industry is to avoid pricing itself out of the market, this staggering burden of billions of dollars spent unproductively must be cut down. Raw materials and labor costs are at all-time highs and the indices are mounting. Mechanization of handling is the only area in the costs picture where substantial savings can be effected."



## Balco The New Controlled Carbon ATMOSPHERE FURNACE

- MOST OPERATIONS
- LEAST INVESTMENT

Write for  
full details  
and  
performance  
figures.

2634G

**'Surface'** Standard Rated  
FURNACES  
SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO

The new Balco Furnaces provide clean, scale-free hardening, gas carburizing, and carbon restoration of plain and alloy steels. This is accomplished by the accurate control of the carbon potential of the atmosphere.

The Balco Furnace is a Standard-Rated, Gas-Fired Atmosphere Furnace of the muffle type with an integral RX atmosphere generator, and is available in three types—two for clean hardening and one for gas carburizing. Of the former, one type has a temperature range from 2000° to 2400° F, the other from 1400° to 1850° F. The range of the gas, carburizing, furnace is from 1400° to 1850° F.

The Balco Furnaces make available to the small furnace user a multiple-purpose unit for clean hardening, gas carburizing, carbon restoration and other carbon controlled heat treatments. One such Balco unit in operation in a large commercial heat treating plant has successfully processed 67 different grades of tool steel.



Comtorplug in use on turret lathe.

Here's HOLE GAGING that matches  
the new machines in speed, accuracy

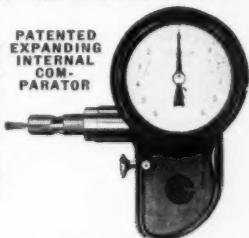
### COMTORPLUG

used for bench inspection and AT or IN  
the machine

Gages holes 1/8" to 8" dia. to fractions of .0001"

Modern machine tools have NOT outrun ALL shop gages! Although solid plugs are inadequate, the patented expanding, internal gage known as "Comtorplug" puts positive, precise gaging in the hands of your machine operators and bench inspectors. Made in sizes to gage holes from 1/8" to 8" dia. Shows exact size (not a passing reading), detects out-of-round, front or back taper, bell mouth, etc., to fractions of .0001". Automatic accuracy, free of human variations. Gages without removing work from chuck. In use at machines in hundreds of plants—"shop ruggedness with laboratory accuracy." Your new machines can produce the top accuracy of which they are capable, only if your operators have gaging precision comparable to the machine's precision. "Comtorplug" is the answer—see it and you'll see why.

PATENTED  
EXPANDING  
INTERNAL  
COM-  
PARATOR



Request 8-page Bulletin No. 33

## COMTOR CO.

62 Rumford Avenue

Waltham, Mass.

Other Comtor Products:  
"COMTORGAGE", Precision  
External Comparator:  
Bulletin 30

COMTOR SURFACE SMOOTH-  
NESS COMPARETOR:  
Bulletin 32A

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

333



Available in 8 sizes—  
capacity, 6 to 80 tons.

## *Speed Press Work*

### with FEDERAL DIAL FEEDS

Federal Dial Feed Presses produce scores of items which formerly required special machinery of limited utility—and increase production as much as 3 to 6 times besides! Dials are easily indexed to any part of the crankshaft revolution, from 90 to 120 degrees, and have positive-locking mechanism. Automatic loading and ejecting mechanisms can be used to increase speed further. Write for catalog of complete Federal Press line.

## THE FEDERAL PRESS CO.

447 Division St., Elkhart, Ind.—Telephone 2831

### STANDARDS BUREAU FORMS ATOMIC PHYSICS DIVISION

The National Bureau of Standards (Washington 25, D. C.) has formed a Division of Atomic Physics in which the main Bureau activities relating to atomic and molecular physics have been grouped together, according to an announcement by Dr. E. U. Condon, Director of the Bureau. The new division promotes fundamental fact finding research and precise determination of important fundamental standards in the field of atomic physics. This research will be applied to the establishment of primary and second-

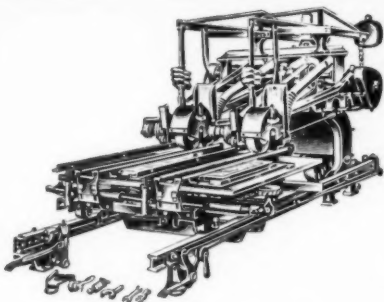
ary standards of reference as calibrated sources of radiation, and is responsible for safety codes and protection of Government interests. Six sections make up the new division: Spectroscopy, Electronics, Mass Spectrometry, Radioactivity, X-Rays, and Atomic Physics.

At the present time, the Spectroscopy Section is extending the analysis of atomic spectra—work pioneered at the Bureau twenty-five years ago. The Electronics Section is divided into two units concerned with the emission of electrons and atomic ions from various materials and with the physics of electron and ion ballistics. The Mass Spectrometry Section is applying this important research tool to chemical analysis, the control of production of synthetic rubbers, and the structure of organic plastics.

The Radioactivity Section is the national standard-

izing laboratory for the measurement of radioactive materials and radiations. It has measured all commercially sold radium preparations from the time radium first became available in the United States. Sensitive methods measure radioactive contaminations in the air for the protection of industrial workers. Precise standards for the measurement of neutron radiation are now being developed.

The X-Ray Section is engaged in a program of measurement standardization and protection studies that are of particular importance to all research institutions using high voltage x-ray equipment.



EXCELSIOR No. 27  
**AUTOMATIC**  
 GRINDING and POLISHING  
**MACHINE**

EXCELSIOR TOOL & MACHINE CO., EAST ST. LOUIS, ILLINOIS

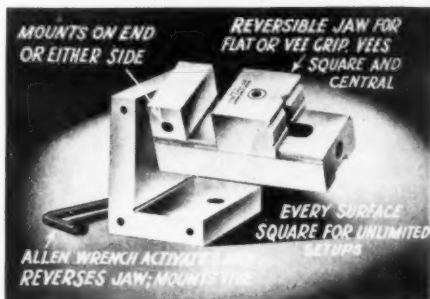
HERE IS A  
*Machine*  
 FOR  
 GRINDING and POLISHING

*Stove Tops*  
*Auto Bumpers*  
*Electric Irons*  
 AND  
*Other Products*

## Toolmakers!—Inspectors!

Here is a New Fixture

Completely square within .00015"



Rockwell 'C' 62-64

### STA-GA-CO COMBINATION VISE & ANGLE PLATE

(A Product of Precision Gauge-Makers)

GALE FORSSEN CO., 64 Monmouth St., Springfield 9, Mass.

(Dealers—Several Sections Open For Distribution)

# FOREDOM Flexible Shaft MACHINES

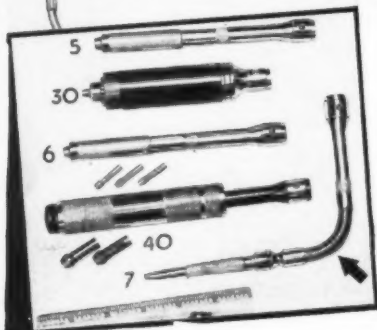


**FOREDOMS  
are TOPS  
in the  
Small Grinder  
Field**

**Here are 4  
REASONS WHY!**

1. Extra power and longer motor life. Motor not dwarfed to fit hand.
2. Correct handpiece size for delt, sensitive, finger-tip control.
3. Complete range of handpieces types. You fit the tool to job at hand.
4. Small handpiece size lets you get into those "hard-to-reach" places.

**USE FOREDOMS** to grind, polish, drill, rout, mill, saw, slot, clean, sand, etch, engrave, etc. **FOREDOMS** are profitable additions to all departments — production, maintenance, or tool. The **FOREDOM** line includes "hang-up" models as illustrated and easily-transportable bench models. Foot rheostat is standard with most of them.



5 quickly interchangeable handpieces types—pencil sizes and larger—some with flexible wrist—see arrow

Our Catalog 109 gives you valuable information as to how you can profitably employ **FOREDOMS**. It will pay you to send for it.

**Order NOW from**

**FOREDOM ELECTRIC CO.**

Dept. 109

**More than a quarter century of experience in building  
Flexible Shaft Machines for home and industry.**

**27 PARK PLACE, NEW YORK 7, N. Y.**

## TOO MANY PEOPLE DEMANDING SOMETHING MORE FOR NOTHING MORE

Far too many people are demanding an ever-increasing standard of living, without realizing that the burden of producing these things falls on their own shoulders, declared L. E. Osborne, senior operating Vice President of the Westinghouse Electric Corporation, Pittsburgh, Pa., at a meeting of the Pennsylvania Electric Association.

The man in the shop or in any community has more money, but he can buy little more of the things he wants with it. One of the first things that oc-

curs to those who think they can get something more for nothing more is to "take it out of profit." But profits, of course, are reinvested in inventories, which mean more and better jobs, more and better products.

In the past, more money in a man's pocket meant he could buy more goods. Why not now? "Can we get him to see himself and his problems not as an individual, but as one of a community of 142,000,000 people, all having more money and all wanting to spend it for more of the things they need? I think he will understand if the American people have increased their output of manufactured goods by only 8 to 10 per cent per person in this period, then, as a people, we can buy only 8 to 10 per cent more manufactured goods, regardless of how much money we have to bargain with."

Something more for nothing more and people's ignorance of the basis of a better living standard hinder industry's efforts to advance.

Mr. Osborne concluded:

"Perhaps he will understand that what we Americans have been doing is paying ourselves wage and salary increases in advance for an increase in production which we have not yet produced. Perhaps then he will understand that it is not profits that are hurting him, but it is to profits that he must look to provide him with the facilities... to produce more in order to have more."

Standard Since 1911



# **INCLINABLE POWER PRESSES**

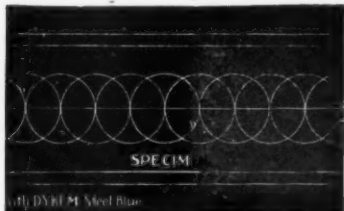
5 to 79 tons

**NO. 5 BACK  
GEARED TYPE**

Write for  
catalog.

**L & J PRESS CORP.**

SUCCESSORS TO Lushbough-Jordan Tool & Machine Co.  
1625 STERLING AVE. ELKHART, INDIANA



# **DYKEM STEEL BLUE STOPS LOSSES making dies & templates**

Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

Write for full information.

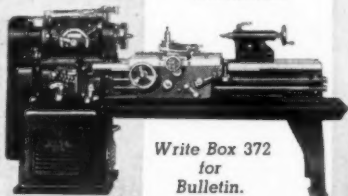
# **THE DYKEM COMPANY**

2301G North 11th St., St. Louis, Mo.  
In Canada: 2466 Dundas St. West, Toronto, Ont.

# **CARROLL AND JAMIESON LATHES 15" AND 16"**

12 Speed Geared  
Head Motor Drive  
Timken Mounted  
Spindle

Modern Design—  
Liberal  
Dimensions



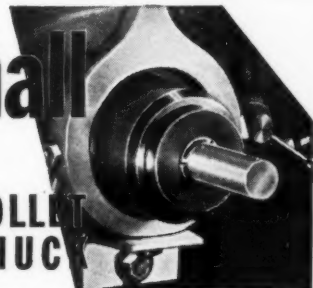
Write Box 372  
for  
Bulletin.

**THE CARROLL & JAMIESON  
MACHINE TOOL CO.**

BATAVIA • OHIO, U. S. A.

# hall

# COLLET CHUCK



**SPEED UP** production in multiple operations with push-out type Hall Collet Chuck. Full spindle capacity or over. Tremendous grip over or under stock size to .007—without adjustments...no bearings, friction, heat or loss of power. Instant release without stopping lathe.

Two-inch capacity, now only \$145

One-inch capacity, \$95

Round, square or hex collets, plain—serrated  
**HALL MANUFACTURING COMPANY**  
622 Tularosa Drive • Los Angeles 26, Calif.

# BARGAINS!



## HIGH SPEED DRILLS

### JOBBERS

### LETTER

### WIRE GAUGE

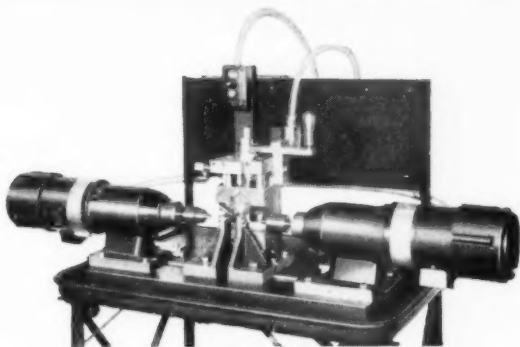
Diam.	Per Doz.	Size	Per Doz.
1/64	\$2.69	A	\$3.96
1/32	2.22	B	4.16
3/64	1.53	C	4.16
1/16	1.91	D	4.27
5/64	1.96	E	4.27
3/32	2.03	F	4.76
7/64	2.16	G	4.76
1/8	2.28	H	5.07
9/64	2.48	I	5.07
5/32	2.67	J	5.07
11/64	2.86	K	5.22
3/16	3.08	L	5.54
13/64	3.32	M	5.71
7/32	3.64	N	6.02
15/64	3.96	O	6.62
1/4	4.27	P	6.81
17/64	4.76	Q	7.44
9/32	5.22	R	7.44
19/64	5.71	S	8.08
5/16	6.17	T	8.08
21/64	6.81	U	8.71
11/32	7.44	V	9.24
23/64	8.08	W	9.52
3/8	8.71	X	10.05
25/64	9.52	Y	10.05
13/32	10.29	Z	10.83
27/64	11.09		
7/16	11.88		
29/64	12.67		
15/32	13.46		
31/64	14.41		
1/2	15.36		

**B  
A  
R  
G  
A  
I  
N  
S**

No.	Per Doz.	No.	Per Doz.
1	\$4.09	32	\$2.09
2	4.09	33	2.09
3	4.09	34	2.00
4	3.77	35	2.00
5	3.77	36	1.96
6	3.77	37	1.87
7	3.45	38	1.87
8	3.45	39	1.87
9	3.45	40	1.78
10	3.32	41	1.78
11	3.32	42	1.74
12	3.32	43	1.65
13	3.08	44	1.65
14	3.08	45	1.65
15	3.08	46	1.59
16	2.95	47	1.59
17	2.95	48	1.59
18	2.86	49	1.59
19	2.76	50	1.53
20	2.76	51	1.53
21	2.76	52	1.53
22	2.63	53	1.53
23	2.57	54	1.53
24	2.57	55	1.53
25	2.48	56	1.53
26	2.48	57	1.53
27	2.48	58	1.53
28	2.28	59	1.53
29	2.28	60	1.53
30	2.28	61-70	2.22
31	2.09	71-80	2.69

**FREE** 128 Page Catalog Showing Our  
Complete Line of Machine Shop Equipment.

**EASTERN TOOL SUPPLY CO.**  
**176 GRAND ST. NEW YORK 18, N. Y.**



## *Drilling and De-burring Cotter Pin Holes*

In the above set-up, designed and built by D. A. Smith & Co., Detroit, for J. B. Du Pont Co., Birmingham, Mich., two Govro-Nelson Automatic Drilling Units are drilling a cotter pin hole from one side and countersinking from the other.

The machine will take stock of various diameters up to  $\frac{3}{8}$ ", drilling and countersinking holes from .070" to  $\frac{9}{64}$ ". With  $\frac{5}{16}$ " stock,  $\frac{7}{64}$ " cotter pin holes are drilled and de-burred at the rate of 550 per hour.

Send for literature showing many other examples of how Govro-Nelson Drilling Units are increasing production rates and decreasing labor costs in plants throughout the nation.

**WRITE FOR**  
*Literature*

### **GOVRO-NELSON CO.**

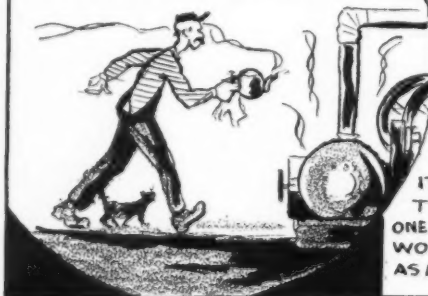
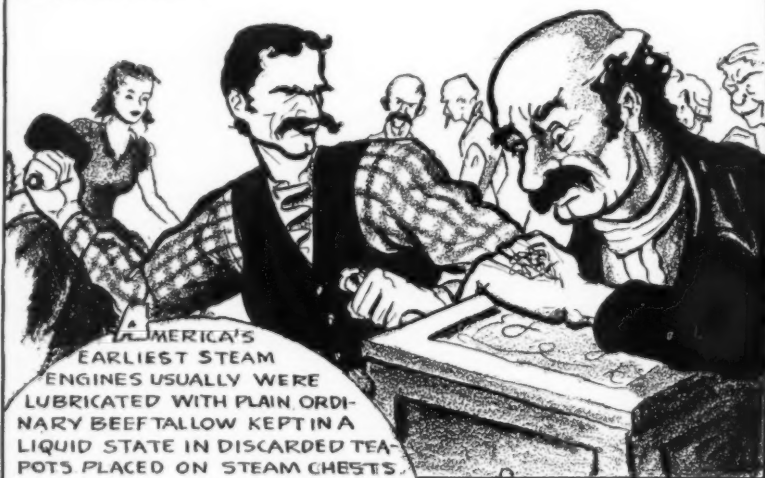
*Machinists of Precision Parts  
for 25 Years*

**1933 Antoinette  
Detroit 8, Mich.**

*Automatic* **DRILLING UNIT**

# Mechanics Through the Ages

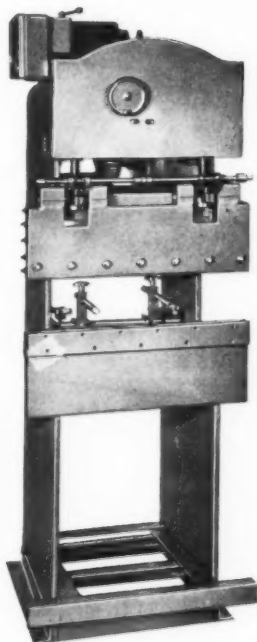
AS LATE AS 1818 NO LOCKSMITH OR MECHANIC COULD BE FOUND SKILLED ENOUGH TO "PICK" THE SIMPLE LOCKS FASTENING THE OAK CHEST WHICH CONTAINED THE CROWN JEWELS OF SCOTLAND. OFFICIALS WERE OBLIGED TO FORCE OPEN THE LOCKS WHICH TODAY COULD EASILY BE UNLOCKED WITH A SIMPLE BENT SKEWER!



**GUN**  
FLINTS AS PERFECT AS THOUGH CUT ON A LAPIDARY'S WHEEL WERE TURNED OUT AT THE RATE OF 350 OR MORE A DAY BY FRENCH CRAFTSMEN OF THE 1700'S USING ONLY HAND TOOLS! THESE GUN FLINTS, PRICED AT ONE FARTHING (ABOUT 1/2¢) A PIECE WOULD HAVE COST FIFTY TIMES AS MUCH IF MADE IN ANY OTHER WAY!

# NEW

## 24" ALL - STEEL WELDED PRESS BRAKE

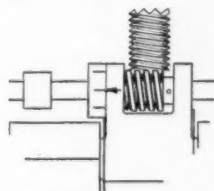


**WRITE OR WIRE  
FOR FULL DETAILS**

A new press brake to satisfy the growing demand for a smaller, less expensive machine, has been developed by Knight Machinery Company, 1001 S. Delaware Street, Indianapolis 2, Indiana. Identified as the 24-inch all-steel, welded Press Brake, this small press is sturdily built and is designed for smaller jobs. In this way larger and more costly equipment can be released for other work. Features of the new Knight Press Brake include heavy welded construction, conveniently placed switches and speed control handle, enclosed moving parts (except ram) between the uprights and a capacity ranging up to 18 gauge x 24" over 90° die. The Press Brake operates at speeds from 19 to 67 strokes per minute and occupies a floor space of only 30" x 24". The height is 69" over the motor and weighs only 1000 lbs. when skidded. Extra equipment is also available and consists of front operated gauges, extra width platen, light behind ram, dies and casters for easy moving.



RAM UP - (U)      (D) - RAM DOWN



Note cut of micrometer dial, making possible adjustments of one thousandth. Easily disengaged coupling allows fast ram parallel adjustment. Speed is infinitely variable within its range. Dry die clutch easily, quickly adjusted without wrenches.



# KNIGHT

## MACHINERY CO.

1005 SOUTH DELAWARE • INDIANAPOLIS 2, IND.

Abrasive Cloth, Paper, Disc, Belts, Wheels, Stones, Etc. 54, 55, 106, 130, 131, 187, 264, 267

Aftercoolers, 232

Air-Operated Equipment (Look for specific item)

Angle Rolling Machine, 335

Angles, 20, 70

Angles, Iron, 260, 329

Balancing Machines, 7

Balancing Ways, 207

Bar Feeds, 18

Bearings, Ball, 120

Bearings, Oilless, 239

Bearings, Thrust, 315

Bench, Work, 70

Bending Equipment, 75

Bits, Tool, 289

Blades, Band Saw, 90, 231, 234

Blades, Cut Off, 193

Blades, Hack Saw, inside front cover, 231

234

Blowers, 353

Boring Bars, 50

Boring, Drilling and Milling Machines, 44

79

Boring Heads, 72

Boring Tools, 84

Brakes, Apron, 168

Brakes, Press and Bending, 57, 341

Broaching Machines, 197

Buffers, Portable Electric, 172, 356

Burs, 123

Bushings, Drill Jig, 36, 279, 313, 318

Cams, 320

Carbide Blanks, 313

Carbides, 95, 167

Carbides and Special Cutting Tools, 261, 289, 313

Castings, 208

Centering Machines, 161

Centers, Lathe, 260

Centers, Live, 97, 182, 309, 317

Chip Guns, 257

Chisels, 94

Chucks, 12, 13, 15

Chucks, Air-Operated, 347

Chucks, Collet, 171, 223, 337

Chucks, Diaphragm, 117

Chucks, Drill, 121, 329

Chucks, Lathe, 322

Chucks, Magnetic, 163

Chucks, Wrenchless, 305

Clamps, 48, 94

Clutches, 60, 124, 251, 283

Collets, 15, 219

Compressors, Air and Gas, 92, 353

Coning Machines, 28

Coolant Additives, 318

Coolant Systems, 76

Counterbores, 100

Countersinks, 318

Couplings, Air, 251

Cut-Off Machines, 62, 68, 356

Cutting Oils, 17

Cutting Tools, 72, 142, 155, 220, 261,

269, 320

Cutters, Milling, 72, 237, 348

Cutters, Wire, 310

Cylinders, Hydraulic and Pneumatic, 33, 88, 109, 115

Demagnetizers, 317

Dial Feed Tables, 343

Diamond Powder, 285

Diamond Wheels, 267

Diamonds and Diamond Tools, 175, 233

Die Casting, 82

Die Feeds, 30, 65

Die Filing, 245

Die Heads, 47

Die Holders, 98

Die Making Machines, 31, 310

Dies, 15, 53, 99

Die Sets, 61, 77, 313

Diesel Engines, 92

Dividing Heads, 64, 278, 318

Dowel Pins, 309

Dressing Fixtures, Grinding Wheel, 247

Drill Heads, 39, 224, 275

Drill Jig, 296

Drill Table, 116

Drilling Machines, Bench, 330

Drilling Machines, Center, 125, 161

Drilling Machines, Multiple Spindle, 85

Drilling Machines, Radial, 39

Drilling Machines, Vertical, 69, 118, 254

Drilling Units, 339

Drills, Center, Core, Twist, Square, etc., 314, 338

Drills, Deep Hole, 313

Drills, Portable Electric, 107

Drills, Step, 261

Drives, 56, 327

Dust Control Equipment, 40, 46, 112, 345, 356

Emery Wheel Dresser, 273

End Mills, 237

Engines, Oil & Gas, 353

Etchers, 294

Files, 19, 147

Files, Rotary, 15, 19, 142

Flexible Shaft Equipment, 15, 39, 43, 111, 142, 185, 274, 336

Form Tools, 26, 149, 237

Furnaces, Heat Treating, 21, 184, 276, 288, 333, 351



## THE NEW AIR-OPERATED ALLEN DIAL FEED TABLE

**Solve That SPECIAL Production Problem  
with our STANDARD Feed UNITS**

**For use with PUNCH PRESS, DRILL PRESS,  
PRODUCTION MILLER, SPOT WELDER, etc.**

**Recommended for assembling, punching, machining of nuts, stampings.**

**MODEL A**—A 3-way valve, actuated by some motion from the machine to which the table is to be synchronized, allows compressed air to move a hardened and lapped piston to operate the Pawl arm. The Pawl indexes the plate and LOCKS it in the indexed position until the valve is released allowing a spring to return the Pawl, ready for the next indexing.

*Model A is available in two sizes:*

No. 7 $\frac{1}{4}$ -A, —7 $\frac{1}{4}$ " Index Plate, 9" Base, 2 15/16 overall height—\$125.00

No. 11-A, —11" Index Plate, 14" Base, 4" overall height — 175.00

Special Index Plates available with from 8 to 40 notches. 12-position is standard.

**MODEL B**—An adaptation of Model A wherein a special control valve is incorporated so that the plate is automatically self-indexing. By merely turning a screw speed is adjustable from one indexing each half second to one each ten seconds. The table is locked in position between indexings. Recommended for soldering, assembly, etc., where no mechanical motion is available.

*Model B is available in two sizes:*

No. 7 $\frac{1}{4}$ -B, (specifications same as Model 7 $\frac{1}{4}$ -A)—\$155.00

No. 11-B, (specifications same as Model 11-A)— 205.00

**ACCESSORIES**—Specially designed and made for use with Allen Dial Feed Tables.

- Air-operated down clamps and side clamps with 4X power factor are available for holding the work piece.
- Knockout for ejection of the work piece from the index plate.
- Special 2- and 3-way valves to synchronize the clamps and knockout with the table motion thereby tremendously increasing the versatility of operation.

*We invite inquiries concerning your special problems. Our engineering department is ready to cooperate with you.*

*Write for illustrated brochure.*

Prices F.O.B. Brooklyn, New York

Manufactured by

**The A. K. ALLEN COMPANY**

**3011 Ft. HAMILTON PARKWAY • BROOKLYN 18, N. Y.**

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

Gage Blocks, 23, 243  
Gages, 3, 14, 108, 117, 332, 333  
Gages, Grinding Wheel for automatic size control, 262, 263  
Gages, Pin, 122  
Gear Shapers, 71  
Gears and Gear Units, 220, 260, 311, 316, 318, 320  
Graduating Machines, 96  
Grinders, Abrasive Belt, 321  
Grinders, Air, 186  
Grinders, Bench, 107, 356  
Grinders, Carbide Tool, 121, 311  
Grinders, Chipbreaker, 59  
Grinders, Cylindrical, 93  
Grinders, Drill, 25, 31, 253, 345  
Grinders, Hack & Band Saw, 323  
Grinders, Pedestal, 56, 356  
Grinders, Pneumatic, 89  
Grinders, Portable Electric, 49, 107, 176, 194, 195  
Grinders, Surface, 102, 174, 251  
Grinders, Tap, 203, 345  
Grinders, Tool Post, 356  
Grinders, Tools and Cutters, 25, 31, 205, 323  
Grinders, Universal, 121  
Grinding Forms, 261  
Grinding Machine Attachments, 335  
Grinding Wheel Dresser, 32  
Grinding Wheels, 54, 55, 194, 195  
Guards, 305  
Guides, Tap, 230

Hammers, 107, 217, 316  
Heads, Collet, 201  
Heads, Facing, 162, 321  
Hinges, 222  
Holders, Tool, 4, 345  
Hopper Units, 319  
Hydraulic Equipment (Look for specific item)

Illuminating Equipment, 38, 315, 329  
Indexing Heads, 153, 221, 265  
Indicators, 108, 139

Jigs, Cone-lok, 117, 325

Keyseaters, 284, 320  
Keyway Broach Tips, 29  
Knurls, 320  
Knurls, Holders, 188

Lapping Compounds, 244, 288  
Lapping Equipment, 288, 318, 329  
Lathes, Automatic, 7  
Lathes, Bench, 184

Lathes, Block, Gap, 327  
Lathes, Engine and Toolroom, 8, 9, 35, 91  
Lathes, Mandrels, 315  
Lathes, Polishing, 35, 39, 63, 283  
Lathes, Precision, 74, 128, 210, 216, 337  
Lathes, Production, 52  
Lathes, Turret, 2, 7, 105  
Layout Materials, 224, 337  
Levels, 241  
Light Wave Equipment, 23  
Locators, Optical, 277  
Lubricants, 6, 154  
Lubricators, 61, 173, 326

Magnifiers, 235, 307  
Maintenance Materials, 212, 259  
Mandrels, 218, 324  
Marking Machines, 281  
Micrometers, 3, 14  
Milling Fixtures, 202  
Milling Machines, 37, 79, 118, 328  
Milling Machines, Attachments, 63  
Milling Machines, Automatic, 210  
Milling Machines, Hand, 246  
Milling Machines, Vertical, 279  
Molders, 172  
Molds, Hammer, 215  
Motor Drives, 249  
Motors, 41, 56, 81

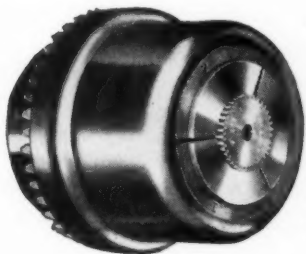
Pantograph Machines, 153  
Parallels, 70, 269, 329  
Planers, 58  
Plates, Surface, 70, 213, 247  
Portable Tool Accessories, 176, 194, 195  
Portable Tools, 194, 195  
Presses, Air, 48, 225, 226  
Presses, Arbor, 268, 298, 309  
Presses, Drill, 39, 58, 63, 255  
Presses, Foot, 242, 257, 298, 334, 337  
Presses, Heavy Duty, 156, 157  
Presses, Horning, 303  
Presses, Hydraulic, 16, 67, 207  
Presses, Power, 168  
Presses, Punch, 51, 78, 177  
Presses, Spring, 249  
Processing Machines, 73  
Profile Grinders, 296  
Pullers, 61  
Pumps, 24, 141, 353  
Pumps, Coolant and Lubricant, 165  
Pumps, Vacuum, 92  
Punches, 94, 317  
Pyrometers, 318

Racks, 251, 260  
Radius Dressers, 261  
Rawhide, 110

# NOW GET EXACT CONCENTRICITY AND PARALLELISM

## THE NEW *Bordjaw Chuck* WAY

THE BORDJAW CHUCK is a precise, collet-like work-holder specially designed to simplify and speed the use of the bored-jaw method of holding work on lathes with  $1\frac{1}{2}$ "-8 spindle threads. It has three removeable, replaceable and reusable jaws which are bored and faced to work-fitting size in the lathe on which the part is to be machined. The cast iron jaws are numbered to insure their accurate replacement when the same job is repeated, or they can be rebored to a larger diameter for new jobs.



Other features:—

- ★ Jaws close without any backward or forward motion—thus reference surfaces remain stationary—insuring uniform work lengths.
- ★ Increases collet capacity of small lathes to 2" O.D.—accommodates bar stock up to the diameter of the spindle.
- ★ Holds work absolutely concentric and parallel — jaws are bored concentric, and flanges faced parallel in the lathe for each new job.
- ★ Replaces dozens of standard and special collets —saves many hours of special machining—and often eliminates the use of complicated fixtures.

Send the Coupon Today for the Complete Details of This New Labor and Tool Saver.

Please send me full details on the BORDJAW CHUCK — Bulletin 947. H

Name..... Title.....

Company .....

Street .....

City..... State.....

**EDWARD BLAKE CO.**  
634 COMMONWEALTH AVE.  
NEWTON CENTRE 59, MASS.

BLAKE TAP GRINDERS—FILTAIRE PORTABLE DUST COLLECTORS—AMERICAN TOOL HOLDERS—BLACK  
DIAMOND PRECISION DRILL GRINDERS—WALTHAM CUTTER SHARPENERS

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

Reamer Sets, 307  
Reamers, 237, 281, 314  
Reciprocating Tools, 42  
Reel Stands, 119  
Riveters, 309  
Riveting Machines, 261  
Rod Parters, 104  
Roll Feeds, 119  
Roll Forming Machines, 221  
Routers, 356

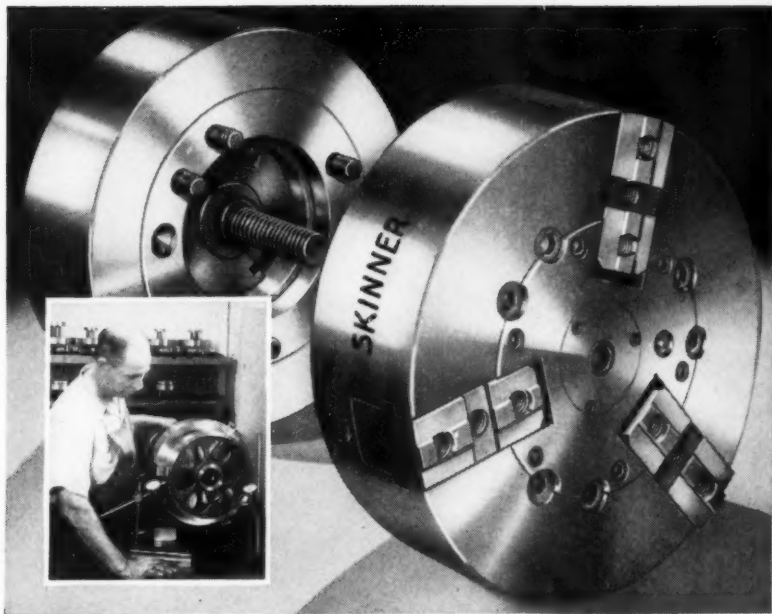
Sander Heads, 172  
Sanders, 89  
Sanders, Belt, 58, 252  
Sanders, Disc, 107  
Saw Blades, Band, 139  
Saw Blades, Hack, 139  
Saw Blades, Slitting, 196  
Saw Sharpeners, 310  
Sawing Machines, Band, 39, 45, 58, 66, 87, 101  
Screw Drivers, Power, 107, 356  
Screw Machines, Automatic, 10  
Screw Machines, Inserted, 118  
Screw Machine Products, 245, 289  
Screws, Cap, Set, Socket and Machine, 313, inside back cover  
Screws, Transfer, 222, 320  
Scrapers, 207  
Second Operation Machines, back cover  
Services: Milling, Grinding, Lapping, Rebuilding, Repairing, Business, etc., 223, 289, 321  
Shapers, 11, 63, 91, 210  
Shaping Tools, 252  
Shearing Machines, 156, 157  
Shears, Portable, 271  
Shears, Throatless, 183, 287  
Shim & Gage Stock, 266  
Sine Bars, 20, 298, 288  
Slide Tools, 105  
Socket Extension, 113  
Spacers, 331

Spacing Collars, 164, 266  
Speed Reducers, 86, 271, 316  
Spindles, 329  
Springs, 245  
Squaring Shears, 298  
Staking Machines, 325  
Stamps, 204, 230  
Steel and Steel Stock, 139, 285  
Steels, 132  
Superfinishing Machines, 7  
Super Spacer, 236  
Surfacers, 39, 235  
Switches, 99, 225

Tables, Elevating, 226, 254  
Tables, Rotary and Index, 20, 255, 270  
Tap Extractors, 294  
Tappers, 208, 288, 319, 356  
Tapping Attachments, 15, 83, 315  
Tapping Machines, 15, 83, 254, 302  
Taps, 3, 15, 53, 99, 281, 349  
Transmissions, 318  
Thread Milling Machine, 22  
Thread Rolling Machines, 99  
Threading & Boring Tools, 294  
Tools, Flexible Shaft, 27  
Tool Holders, Floating, 193  
Tote Pans, 320  
Turning Tools, 80  
Turrets, Lathe, 246

Valves, 88, 214, 310  
Vises, Bench and Machine, 42, 116, 188, 201, 233, 251, 259, 294, 307, 317, 347

Webbing Equipment and Supplies, 1, 34, 126, 355  
Wheel Dressers, 201, 293  
Wire Mesh, 275  
Wire Thread Measuring Machine, 23  
Wrenches, 114, 349



FRONT & REAR VIEW SERIES 1300

## PRECISELY, Mr. Jones - and faster, too!

Yes, Mr. Jones, a Skinner Power Chuck provides a means to chuck work quickly, easily and accurately. This means that a machine equipped with a Skinner Air Chuck will be removing metal more hours of every work day, but without burdening the operator. The increase in output will result in production-cost savings that will give you an edge in the increasingly competitive picture of today.

And that's not all, Mr. Jones. There are other features of Skinner Power Chucks about which you ought to know. Take a look at their rugged construction — balanced, forged-steel bodies, ma-

chined all over, provided with wide jaw ribs to keep jaws properly aligned and in the same plane — every part, plus the assembled unit, checked and rechecked. There are years of productive service in every Skinner Chuck. Safety is important, too; that's why Skinner has paid special attention to the wedge-angle. *Once the jaws grip a piece in any position, they will not release even if the air supply is completely cut off!*

Power chucking is a modern time-saving method that offers a simple way to greatly reduce your production costs. Skinner offers a complete line of self-centering and combination power chucks and

allied equipment such as air cylinders, operating valves, gages and filters, plus a nationwide dealer organization that's ready to apply their knowledge and experience to your problems — on the spot.

**The Skinner Chuck Co.**

341 CHURCH STREET, NEW BRITAIN, CONN.

**Skinner Chucks**



**HAND & POWER OPERATED MACHINE CHUCKS — AIR CHUCK EQUIPMENT — FACE PLATE JAWS — MACHINE VISES**

When Writing Advertisers Please Mention **MACHINE** and **TOOL BLUE BOOK**

347

# NEW

# NEW

## HIGH SPEED PLAIN & SIDE MILLING CUTTERS

### H. S. PLAIN CUTTERS

3"x $\frac{1}{4}$ "x1" .....\$2.00 ea.

3"x $\frac{5}{16}$ "x1" .... 2.16 ea.

3"x $\frac{3}{8}$ "x1" ..... 2.28 ea.

3"x $\frac{1}{2}$ "x1 $\frac{1}{4}$ " .... 2.60 ea.

3"x $\frac{5}{8}$ "x1 $\frac{1}{4}$ " .... 2.76 ea.

3"x $\frac{3}{4}$ "x1 $\frac{1}{4}$ " .... 3.00 ea.

3"x $\frac{7}{8}$ "x1 $\frac{1}{4}$ " .... 3.24 ea.

3"x1"x1 $\frac{1}{4}$ " ..... 3.48 ea.

3"x1 $\frac{1}{4}$ "x1 $\frac{1}{4}$ " ... 3.86 ea.

3"x1 $\frac{1}{2}$ "x1 $\frac{1}{4}$ " ... 4.40 ea.

### H. S. SIDE CUTTERS

2 $\frac{1}{2}$ "x $\frac{1}{4}$ "x $\frac{7}{8}$ " ...\$2.16 ea.

3"x $\frac{5}{16}$ "x1" .... 2.60 ea.

3"x $\frac{3}{8}$ "x1" ..... 2.88 ea.

3"x $\frac{7}{16}$ "x1" .... 3.00 ea.

4"x $\frac{3}{4}$ "x1 $\frac{1}{4}$ " .... 5.00 ea.

4"x $\frac{7}{8}$ "x1 $\frac{1}{4}$ " .... 5.70 ea.

5"x $\frac{5}{8}$ "x1 $\frac{1}{4}$ " .... 7.00 ea.

5"x $\frac{3}{4}$ "x1 $\frac{1}{4}$ " .... 8.00 ea.

5"x $\frac{7}{8}$ "x1" .....10.00 ea.

5"x1"x1" .....10.00 ea.

## VICTOR MACHINERY EXCHANGE, Inc.

251 CENTRE ST.

NEW YORK CITY

CANAL 6-5575

# NEW NEW

## HIGH SPEED TAPS

8-32, 10-32, 10-24 ..\$.40 ea.	3/4"-10, 16, .....\$1.50 ea.
1/4"-20, 28, ..... .50 ea.	7/8"-9, 14, ..... 2.00 ea.
5/16"-18, 24, ..... .50 ea.	1"-8, 14, ..... 3.00 ea.
3/8"-16, 24, ..... .50 ea.	1 1/8"-7, 12, ..... 5.00 ea.
7/16"-14, 20, ..... .50 ea.	1 1/4"-7, 12, ..... 5.00 ea.
1/2"-13, 20, ..... .75 ea.	1 3/8"-6, 12, ..... 5.00 ea.
9/16"-12, 18, ..... .75 ea.	1 1/2"-6, 12, ..... 5.00 ea.
5/8"-11, 18, .....1.00 ea.	

### GREENFIELD TAP & DIE WRENCHES

No. 5—3/16" to 1/2" Tap Wrenches .....\$2.25 each

No. 7—1/4" to 1" Tap Wrenches ..... 3.50 each

## VICTOR MACHINERY EXCHANGE, Inc.

251 CENTRE ST.

NEW YORK CITY

CANAL 6-5575

# Index to Advertisers

## A

Abart Gear & Machine Co.	316
Abrasive Machine Tool Co.	96
Ace Abrasive Laboratories	285
Acme Industrial Company	279
Acme Tool Co.	42
Acme Wire & Iron Works	275
Acorn Bearing Co.	315
Acro Metal Stamping Co.	61
Adamas Carbide Corp.	313
Aget-Detroit Co.	40
Aleo Tool Co.	98
Almond Mfg. Co., T. R.	329
Allen Co., A. K.	343
Allen Mfg. Co.	Inside Back Cover
Aloft Mfg. Co.	317
American Air Filter Co.	46
American Broach & Machine Co.	197
American Diamond Tool & Gauge Co.	332
American Drill Bushing Co.	36
American Society of Tool Engineers	103
Ames Co., B. C.	108
Anderson Bros Mfg. Co.	207
Anderson Oil Co.	154
Andersons, Inc.	207
Arcanum Aluminum Foundry	207
Argento Oilless Bearing Co.	239
Armour & Co.	187
Armstrong-Blum Mfg. Co.	Inside Front Cover
Armstrong Bros. Tool Co.	4
Associated Traders Inc.	213
Atlantic Gear Works	318
Atlas Press Company	63
Auto Moulding & Mfg. Co.	222
A-ey Drilling Machine Co.	85

## B

Balder Elec. Co.	205
Barnes Co., W. O.	90
Bath Co., John	313
Baumbach Mfg. Co., E. A.	313
Beaver Gear Works	311
Behr-Manning	106
Benchmark Mfg. Co.	51
Benton Company	207
Beverly Shear Mfg. Co.	287
Billings & Spencer Co.	114
Black Diamond Saw & Machine Co.	253
Blake Co., Edward	345
Bloomfield Tool Corp.	320
Bodine Corp.	118
Boggs & Co., Henry F.	203
Boice-Crane Co.	58
Bremil Mfg. Co.	271
Brown Engineering Co.	163
Brown & Sharpe Mfg. Co.	163
Rub & Son, George F.	320
Buffalo Forge Co.	75
Buffalo Mch. Co.	251
Buffulco Co.	182
Burke Machine Tool Co.	279
Burr & Son, J. T.	320

## C

Capewell Mfg. Corp.	234
Carborundum Co.	130-131
Carbide Johnson Machine Co.	60
Carroll & Jamieson Machine Tool Co.	337
Center Scope Products	277
Central Mch. Works Co.	52
Challenge Machinery Co.	70
Chandler Tool Co.	162

Chicago Mfg. & Distributing Co.	6
Chicago Pneumatic Tool Co.	92
Chicago Rawhide Mfg. Co.	110
Chicago Tool & Engineering Co.	259
Chicago Wheel & Mfg. Co.	194-195
Cincinnati Electrical Tool Co.	356
Cincinnati Shaper Co.	11
Cincinnati Tool Co.	94
Columbus Die, Tool & Machine Co.	223
Conet Tool Co.	294
Commander Manufacturing Co.	275
Conitor Co.	333
Cone Automatic Machine Co.	333
Conner Tool & Cutter Co.	10
Continental Tool Works (Div. Ex-Cell-O Corp.)	100
Conway Clutch Co.	124
Cook Co., L. H.	215
Coxton Electric Mfg. Corp.	351
Coulter Machine Co., James	22
Covel Mfg. Co.	174
Crescent Valve Co.	214
Crossman & Son, J. D.	315
Cushman Wheel Co.	86

## D

Dahlstrom Mfg. Co.	230
Danly Machine Specialties	77
Danville Tool Corp.	327
Davis Machinery Co.	255
Dayton Rogers Mfg. Co.	354
Dearborn, J. W.	221
Delco Products	41
Derbyshire Inc., F. W.	216
Desmond-Stephen Mfg. Co.	319
Detroit Power Screwdriver Co.	319
Detroit Stamping Co.	331
Dickerman Mfg. Co., H. E.	65
Dixon & Ryan Co.	321
Dorman Machine Tool Wks.	315
Dreis & Krump Mfg. Co.	57
Dremel Mfg. Co.	176
DuMont Corp.	29
Dumore Co.	27
Dykem Co.	337

## E

Eastern Tool Supply Co.	338
Economy Mch. Products Co.	313
Edroy Products Co.	235
Eisler Engineering Co.	34
Elgin Tool Works	35
Elkro Co.	247
Elliott Mfg. Co.	274
Empire Tool Co.	193
Enco Manufacturing Co.	246
Erickson Tools Div.	293-324
Errington Mechanical Laboratory	319
Excelsior Tool & Machine Co.	335

## F

Fakes Co., Jos. B.	320
Fanco Machine Co.	298
Federal Foundry Supply Co.	310
Federal Press Co.	334
Fellers Gear Shaper Co.	71
Fish-Schuman Corp.	247
Fitchburg Grinding Machine Corp.	93

# HEAT TREAT

## SMALL PARTS, TOOLS & DIES

### *In Your Own Plant*

- Install anywhere by simple wire connection. Quiet in operation. No fumes or odors—no ventilating required.
- Any intelligent man can operate furnace with automatic temperature control, using established procedures.
- Operating cost under 4¢ per hour to hold 1600° F. in Model 3 furnaces, with 2¢ per kw.-hr. rate. Others in proportion.

**NOW YOU CAN** heat treat, harden and temper small parts in your own plant . . . without experienced heat treaters. Economical to install and use, Cooley Electric Furnaces operate efficiently at high or low heats, and save your large furnace time for work requiring large volume capacity. Here are some profitable uses:

**PRODUCTION HEAT TREATING** of small parts . . . Small batches . . . Running pilot lots to pre-determine mass production techniques . . . Emergency repairs . . . Industrial and laboratory testing . . . Miscellaneous controlled heating jobs.



CHAMBER	8" W 6" H 14" L	10" W 6" H 18" L	8" W 6" H 14" L
FROM COLD	1850° F. in 55-65 min.	1850° F. in 55-65 min.	2000° F. in 2½ hrs.
AMPERES	14.8 at 230 v.	19.6 at 230 v.	20.2 at 230 v.
WATTS	3400	4500	4650
MODEL*	MH-3 VH-3 MK-3 VK-3	MH-4 VH-4 MK-4 VK-4	VK-5
PRICE	160.00 185.00 200.00 225.00	245.00 270.00 285.00 310.00	340.00

\* M models complete with hinged door and hearth plate.

V models have counterweighted vertical lift door.

K models include Selective Power Modifier for input control to correct temperature lag.

#### ACCESSORY EQUIPMENT

Electronic operated Veri-tron indicating and controlling pyrometer, with thermocouple and lead wire . . . \$143.00  
Same in self-contained, enclosed panel including line switch and fuses, with steel stand—completely wired . . . 250.00  
Steel stand with shelf . . . 35.00

#### DEALERS AND DISTRIBUTORS WANTED!

Good territories open on this extensive line of self-contained small electric furnaces. Investigate now.

**FORCED CIRCULATION AIR DRAW FURNACES — Write for data.**

#### FREE LITERATURE

NEW CATALOG completely describes all models and applications for each. Write today for your copy . . . no obligation.



**COOLEY ELECTRIC MANUFACTURING CORP.**

36 South Shelby Street Indianapolis 7, Indiana

INDIANAPOLIS MACHINERY EXPORT CORP.

Export Manager, 44 Whitehall Street, New York, New York

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

Flexrock Company	212
Foredom Electric Co.	336
Forssen Co., Gale	335
Ford Motor Co. (Johansson Div)	243
Forster Engineering Co.	243
Postoria Pressed Steel Corp.	38
Fray Machine Tool Co.	102
Fulflo Specialties Co.	165

## G

Gallmeyer & Livingston Co.	25
Giddings & Lewis Machine Tool Co. (Davis Boring Tool Div.)	50
Gisholt Machine Co.	7
Gits Brothers Mfg. Co.	326
Glenzer Co., J. C.	97
Gorton Machine Co., Geo.	153
Govro-Nelson Company	339
Graham Mfg. Co.	188
Grant Mfg. & Machine Co.	309
Greaves Machine Tool Co.	220-220
Greenard Arbor Press Co.	268
Greenlee Brothers & Co.	263
Grinders & Fixtures Inc.	265
Grob Brothers	310
Grobet File Co. of America	19

## H

Hall Level & Mfg. Wks.	241
Hall Mfg. Co.	247
Hamilton Tool Co.	254
Hammond Machinery Builders	59
Han-Dee Spring Mfg. Co.	245
Hannifin Corp.	109
Hardinge Brothers, Inc.	Back cover
Hart Machine Co.	202
Hartford Special Machinery Co.	236
Harvey Mfg. Corp.	245
Harvill Mfg. Co., H. L.	82
Haskins Co., R. G.	43
Heim Co.	120
Heimann Mfg. Co.	222
Hendey Machine Co.	91
Heuser Mfg. Co.	296
Hevi-Duty Electric Co.	21
Hobart Brothers Co.	1
Hoberg Gage Co.	122
Howe & Son Inc.	310

## I

Independent Pneumatic Tool Co.	89
Industrial Products Suppliers	266
Ingersoll Milling Machine Co.	37
Ingersoll Rand	24-353

## J

J & S Tool Co.	26
Jacobs Mfg. Co.	12-13
Janette Mfg. Co.	271
Jarvis Co., Charles L.	15
Jefferson Machine Tool Co.	252
Johansson Div. (Ford Motor Co.)	243
Johnson Gas Appliance Co.	276
Johnson Machine & Press Corp.	257
Johnson Mfg. Corp.	87
Johnson & Sons, Wm. C.	168

## K

Kalamazoo T. & S. Co.	45
Kennametal, Inc.	95

Kent-Owens Machine Co.	328
Kao Cutters	314
Kloppenberg Aluminum Foundry Co.	316
Knight Machinery Co.	311
Koebel Diamond Tool Co.	233

## L

L. & J. Press Corp.	337
L-W Chuck Co.	64
Lafayette Tool & Supply Co.	270
Lassy Tool Company	208-270
Leach Machinery Co., H. (Fray)	102
Leavitt Machine Co.	322
Leckinger Machine & Experimental Co.	302
Lee Co., K. O.	121
LeMaire Tool & Mfg. Co.	323
Leona Instrument Co.	315
Leuthwaite Machine Co. T. H.	317
Lima Electric Motor Co.	56
Lincoln Electric Co.	126
Lincoln Park Mfg. Co.	320
Lindley Brothers Co.	183
Line-Rollway Corp.	18
Littell Machine Co., F. J.	310
Logansport Machine Co.	33
Loveloy Tool Co.	72
Lucas & Son, J. L.	320
Luma Electric Equipment Co.	294

## M

Madison-Kipp Corp.	186
Mail Tool Company	111
Maplewood Machinery Co.	321
Marshall Steel Co.	55
Marshalltown Mfg. Co.	183
Marvel Tool & Machine Co.	309
Master Tool Co.	307
Matco Tool Co.	201
Mead Specialties Co.	48
Meredith Corp.	267
Metal Remover Co.	267
Metol Corp.	318
Meyers Co., Wm. F.	149
Michigan Chrome & Chemical Co.	254
Michigan Drill Head Co.	224
Midwest Tool & Engineering Co.	226
Millers Falls Co.	107
Milwaukee Chaplet & Mfg. Co.	296
Miracle Products Co.	223
Modern Machine Tool Co.	116
Modern Motor Drives Div. (Nicholas Eng. Co.)	249
Modern Tool Works	47
Montgomery & Co.	273
Morch & Merryweather Co.	196
Mummet-Dixon Company	321

## N

National Acme Co.	99
Nebel Machine Tool Co.	327
New Albany Machine Mfg. Co.	242
New Britain Tool & Mfg. Co.	317
New England Gear Works	260
New Methods Steel Stamps, Inc.	230
New Milford Carbide Tool Co.	289
Niagara Blower Co.	232
Niagara Machine & Tool Works	156-157
Nichols Eng. Co. (Modern Motor Drives)	249
Nichols Morris Corp.	278
Nicholson & Co., W. H.	218
Nicholson File Co.	147
Nielson, Inc.	317
Nielson Tool & Die Co.	320
Norgren Co., C. A.	173
Numberall Stamp & Tool Co.	204



... for your products.

To speed up your assembly lines, to accelerate your fast repetitive operations—use lightweight, powerful Ingersoll-Rand Air Tools...

Drills... Grinders... Chipping Hammers... Impact Wrenches... Riveters  
... Air Motors... Diggers... Air Hoists... Vibrators... Sanders...

Pumps... Rammers... Screwdrivers, etc.

*Phone our nearest branch office for a demonstration.*



**Ingersoll-Rand**  
11 Broadway, New York 4, N. Y. 62-9

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

353

## O

Oliver Instrument Co. ....	31
O'Neill-Irwin Manufacturing Co. ....	104

## P

Pines Engineering Co. ....	62
Plunket Machine Co., J. E. ....	294
Pneumatics, Inc. ....	88
Porst Brothers Mfg. Co. ....	171
Potter & Johnston Mch. Co. ....	105
Power Plus Products Co. ....	115
Pratt & Whitney ....	123
Procon Safety Chuck Co. ....	83
Production Machine Co. ....	235
Producto Machine Co. ....	30
Pyrometer Instrument Co. ....	318

## Q

Quality Tool Works ....	220
-------------------------	-----

## R

R & L Tools ....	80
Racine Tool & Machine Co. ....	68
Rathbun Co., Louis C. ....	229
Reading Machine Co. ....	284
Reich Mfg. Co., J. R. ....	318
Reiff & Nestor Co. ....	281
Rivett Lathe & Grinder, Inc. ....	2
Robbins Eng. Co. ....	20
Robertson Mfg. Co. ....	34-55
Rockford Clutch Div. ....	283
Rodgers Hydraulic Inc. ....	16
Rotor Tool Co. ....	49
Rouse & Co., H. B. ....	240
Rusnok Tool Works ....	44
Ruthman Machinery Co. ....	141
Rutland Tool Service ....	289
Ryerson & Sons, Inc., Jos. T. ....	132
Ryno, H. Wilson ....	309

## S

Sales Service Machine Tool Co. ....	78
Sanford Manufacturing Co. ....	251
Schauer Machine Co. ....	283
Scherr Co., George ....	269
Schmarie Tool & Engineering Co. ....	289
Schmidt Inc., Geo. T. ....	281
Schultz & Anderson Co. ....	309
Scully-Jones & Co. ....	113
Screw Machine Specialty Co. ....	289
Seneca Falls Machine Co. ....	125
Service Machine Co. ....	177
Severance Tool Industries ....	155-318
Sheldon Machine Co. ....	210
Sibley Machine & Foundry Corp. ....	69
Sidney Machine Tool Co. ....	74
Sigourney Tool Co. ....	250
Simonski, Gilbert S. ....	288
Skinner Chuck Co. ....	347
Smit & Sons, J. K. ....	175
South Bend Lathe Works ....	128
Spiral Mfg. Corp. ....	261
Springfield Machine Tool Co. ....	8-9
Standard Transmission Equipment Co. ....	318
Starrett Co., L. S. ....	139
Stark Tool Co. ....	184
Stokernit Corp. ....	79

Strand Manufacturing Co. ....	305
Sun Oil Co. ....	17
Sundstrand Machine Tool Co. ....	161
Sunnen Products Co. ....	28
Surface Combustion Corp. (Heat treating Div.) ....	333
Syntro Company ....	217

## T

Tanams-Silica Co. ....	259
Tannewitz Works ....	66
Tatra Tool Co. ....	329
Taylor & Fenn Company ....	249
Teeter, C. B. ....	252
Thomas Hoist Co. ....	305
Thomas Machine Mfg. Co. ....	303
Threadwell Tap & Die Co. ....	53
Timesaver Products Co. ....	280
Tool and Supply Co. ....	316
Torit Manufacturing Co. ....	112
Tree Tool & Die Works ....	84
Trindl Products, Ltd. ....	355
Troyke Mfg. Co. ....	259-318
Tubular Micrometer Co. ....	14

## U

U. S. Electric Motors Co. Inc. ....	81
U. S. Hoffman Machinery Corp. ....	76
United Precision Products Co. ....	219
United States Products Co. ....	244

## V

Vanderwall Co., E. H. ....	260
Van Keuren Co. ....	23
Vascoloy-Ramet Corp. ....	167
Veteran Machine Works ....	331
Veteran Tool & Supply Co. ....	307
Victor Machinery Exchange ....	348-349
Victor Saw Works ....	231
Vimco Mfg. Co. ....	329
Vonnegut Moulder Corp. ....	172

## W

Walker-Turner Co. ....	39
Walls Sales Corporation ....	321
Walton Co. ....	294
Wardwell Mfg. Co. ....	323
Weber Machine Corp. ....	325
Wells Mfg. Corp. ....	101
West Coast Aero Tool Co. ....	318
White Dental Mfg. Co., S. S. ....	142
Whitely Metal Tool Co. ....	168
Willey's Carbide Tool Co. ....	311
Wilson, K. R. ....	67
Winter Products Inc. ....	225-226
Wittek Mfg. Co. ....	115
Wolfs New Process Abrasive Wheel Co. ....	264
Woodworth Co., A. ....	117-325
Wyzenbeek & Staff Inc. ....	185

## Y

Yohs Supply Co., Wm. S. ....	260
Yost Mfg. Co. ....	233

# PROFITABLE WELDING

WITH *Easy to Operate*

## TRINDL <sup>SUPER</sup> INDUSTRIAL ARC WELDERS

FOR PRODUCTION

CONSTRUCTION

MAINTENANCE

AND REPAIR



### A Range of Models for Every Welding Job!

"JOB-TESTED" TRINDL WELDERS, outstanding in the welding field because of the Simplified Operation and Ruggedness of Design and Construction, are unbeatable for practical efficient low cost operation. TRINDL WELDERS, preferred for general industrial, farm and automotive production, construction, maintenance and repair, are available in a range of models for every type of shop or welding job.



**Dependable Trindl Welders, Welding Supplies and Accessories are Available to Save You Both — Time and Money...**

Write, wire or phone today for particulars, catalogs  
Jobber and Distributor Inquiries Invited

Write for Selected Distributor Plan

**TRINDL PRODUCTS LTD., 17 E. 23rd St., BC, Chicago 16, Ill.**

## ORDER NOW... for PROMPT DELIVERY!

Our delivery situation is good so we are able to build more and more THE CINCINNATI electrical tools. You can plan now to have your needs served quickly.

**A. BALL BEARING PEDESTAL GRINDER**—Designed and built for continuous production work and all general purpose grinding. Sizes: Up to 15 H.P.

**B. BUFFING AND POLISHING LATHE**—Especially designed, ruggedly built, for continuous service under most severe conditions. Sizes: Up to 15 H.P.

**C. TOOL POST GRINDER**—With or without feed, especially adapted for grinding lathe centers, cutters, reamers, rolls, dies, etc. Can be used in shaper or planer for surface grinding. Sizes:  $\frac{1}{4}$  to 1 H.P.

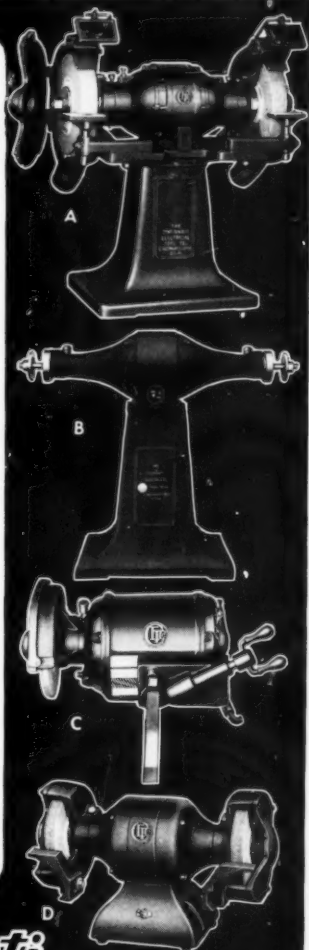
**D. BENCH GRINDER**—Powerful—ball bearing equipped. For all kinds of grinding and general purpose buffing and polishing. Sizes: 6, 7, 8, 10, and 12 inches.

WRITE TODAY FOR COMPLETE DETAILS

### WE MANUFACTURE

Tappers  
Routers  
Nut Setters  
Speed Lathes  
Screw Drivers  
Electric Drills  
Aerial Grinders  
Tool Post Grinders

Abrasive Cut-Off  
Machines  
Bench and Pedestal  
Buffers  
Air Master  
Dust Collectors  
Bench and Pedestal  
Grinders



TRADE *The Cincinnati* MARK

**THE CINCINNATI ELECTRICAL TOOL CO.**

Division of THE R. K. LEBLOND MACHINE TOOL CO.

2620 MADISON ROAD • CINCINNATI 8, OHIO

FOR FIRMER, STRONGER FASTENING OF METAL PARTS

*New, all-purpose*

# ALLENUTS

*Give you* **HEAT-TREATED,  
CLASS 3 FIT TAPPED THREADS  
and DIMENSIONAL ACCURACY**

to match the holding power and  
precision qualities of famous  
**ALLEN HEX-SOCKET SCREWS**

*Plus* **THESE ADDED BENEFITS:**

1. Self-anchoring in non-hardened materials. By tightening screw only, ALLENUT is positively locked by biting action of knurled flutes being drawn into counterbored hole.

2. Anchoring feature does not prevent easy removal of ALLENUT. Fastening can be made any number of times without damage either to ALLENUT or surrounding material.

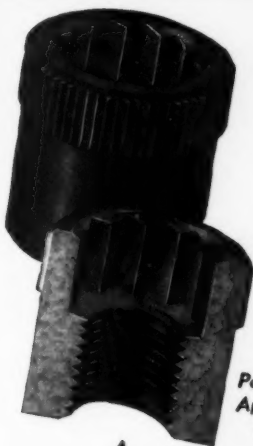
3. 12-point (double hex) socket and sturdy Allen hex keys provide positive, non-slip wrenching action where ALLENUT is countersunk in hardened steel.

4. Can be pressed into soft metals or molded into plastics. When used as insert or bushing, possibility of thread stripping is eliminated. Firm holding is assured due to tight frictional lock produced by heat-treated Class 3 fit threads.

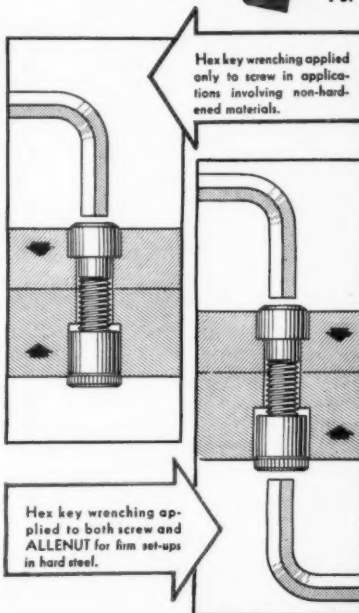
5. ALLENUTS can be set flush with or below containing parts resulting in streamlined contours without projections. Internal socket contributes to compact designs since no allowance is required for wrench clearance.

*ALLENUTS of special heat-treated alloy steel are presently offered in sizes from No. 4 to  $\frac{3}{8}$ " , either NC or NF threads. Sizes from  $\frac{7}{16}$ " to 1" available soon. Order through your Allen industrial distributor.*

Write for illustrated Bulletin N-51, also test samples of the new ALLENUT.



**Patent  
Applied  
For**



Hex key wrenching applied only to screw in applications involving non-hardened materials.

Hex key wrenching applied to both screw and ALLENUT for firm set-ups in hard steel.



**POSITIVE  
WRENCHING  
ACTION**

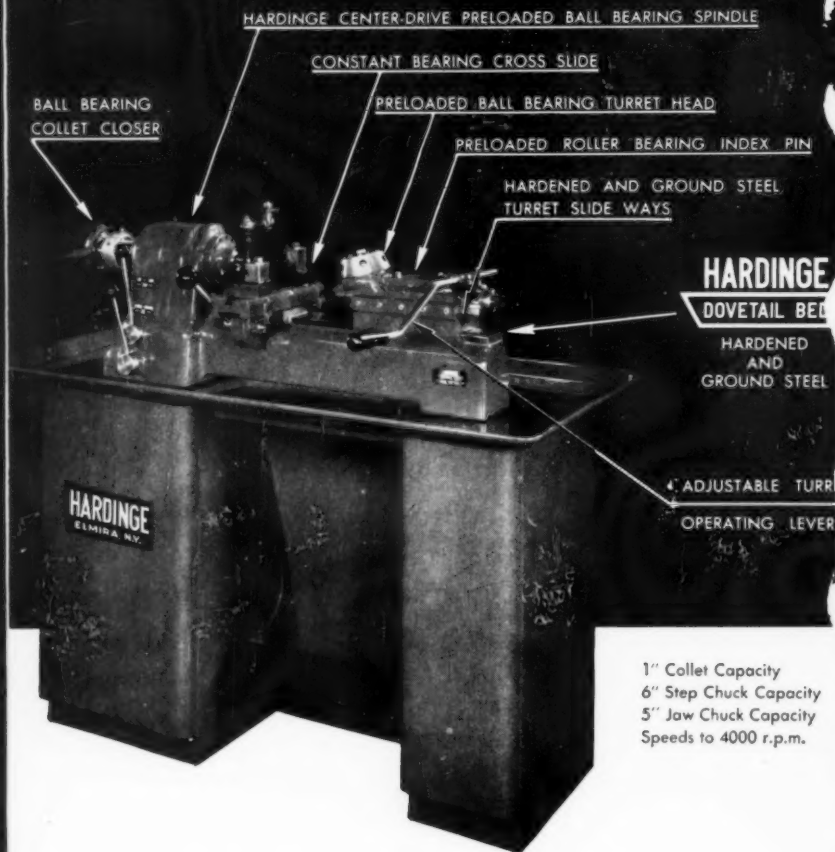
**THE ALLEN MANUFACTURING COMPANY**

**HARTFORD 2, CONNECTICUT, U. S. A.**

# The New HARDINGE High Speed Precision Second Operation Machine

**HARDINGE**  
ELMIRA, N.Y.

## *Features:*



1" Collet Capacity  
6" Step Chuck Capacity  
5" Jaw Chuck Capacity  
Speeds to 4000 r.p.m.

The above features assure sustained accuracy. The performance features of the previous model have been retained. This is the outstanding machine for high speed production of second operation work. Ask for bulletin DSM 59.

**HARDINGE BROTHERS, INC., ELMIRA, N. Y.**

"PERFORMANCE HAS ESTABLISHED LEADERSHIP FOR HARDINGE"

